ENGLISH

# ORTHOPANTOMOGAPH™ OP30

## Digital Panoramic X-ray Unit

## Installation and Set-up Manual

208684 rev. 4 (2014-11)

For type OP30-2,
Ser. No. IO1300001 and later.

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This is the original English language version of the manual.

This installation manual is for units with serial number, Ser. No. **IO1300001** and later.

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# 1. Introduction

## 1.1 About this manual

This manual explains how to install and set up the **ORTHOPANOTMOGRAPH™ OP30** digital panoramic dental x-ray unit (the unit).

You will need to operate the unit during the alignment checking procedure. Make sure that you know how to operate the unit before starting to install and set up the unit.

It is also essential that person installing and setting up the unit should have attended the manufacturer's service training course.

## 1.2 Associated documentation

The **ORTHOPANOTMOGRAPH OP30** Digital Panoramic X-ray Unit User manual.

The **ORTHOPANOTMOGRAPH OP30** Digital Panoramic X-ray Unit Service manual (not supplied in the delivery).

The installation manual for CLINIVIEW™ software or for other dental imaging software to be used with the unit.

The user manual for CLINIVIEW software or for other dental imaging software to be used with the unit.



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## 1.3 Warnings and precautions

### During installation

- When installing the unit always observe local and national safety regulation concerning the installation and use of dental x-ray equipment.
- Failure to install the unit in an approved location according to these installation instructions may cause the device to be dangerous to both patient and operator.
- The aperture plate in the collimator is made of lead (Pb) which is a toxic material. Do not touch it with your bare hands.
- Be careful when working on the unit when the covers have been removed.
  - Some mechanical parts have sharp edges that can cause injuries if mishandled.
  - Some internal components become hot during operation. Take suitable precautions to avoid burning yourself.
  - Some electric components are high voltage and can be lethal if touched. Whenever you are making adjustments to the unit disconnect it from the main power supply before making the adjustment.
- If the unit is to be used with a 3rd party imaging application software, not produced or supplied by Instrumentarium Dental, the 3rd party imaging software must comply with all applicable local laws and regulations on patient information software. This includes, for example, the Medical Device Directive 93/42/EEC and / or the FDA.

### During unit operation

- Read and familiarize yourself with the warnings and precautions in the unit User Manual.
- When checking the alignment of the radiation beam protect yourself from radiation.
- After the unit has been installed and set up, advise the people who will operate the unit to familiarize themselves with the warnings and precautions in the User Manual.



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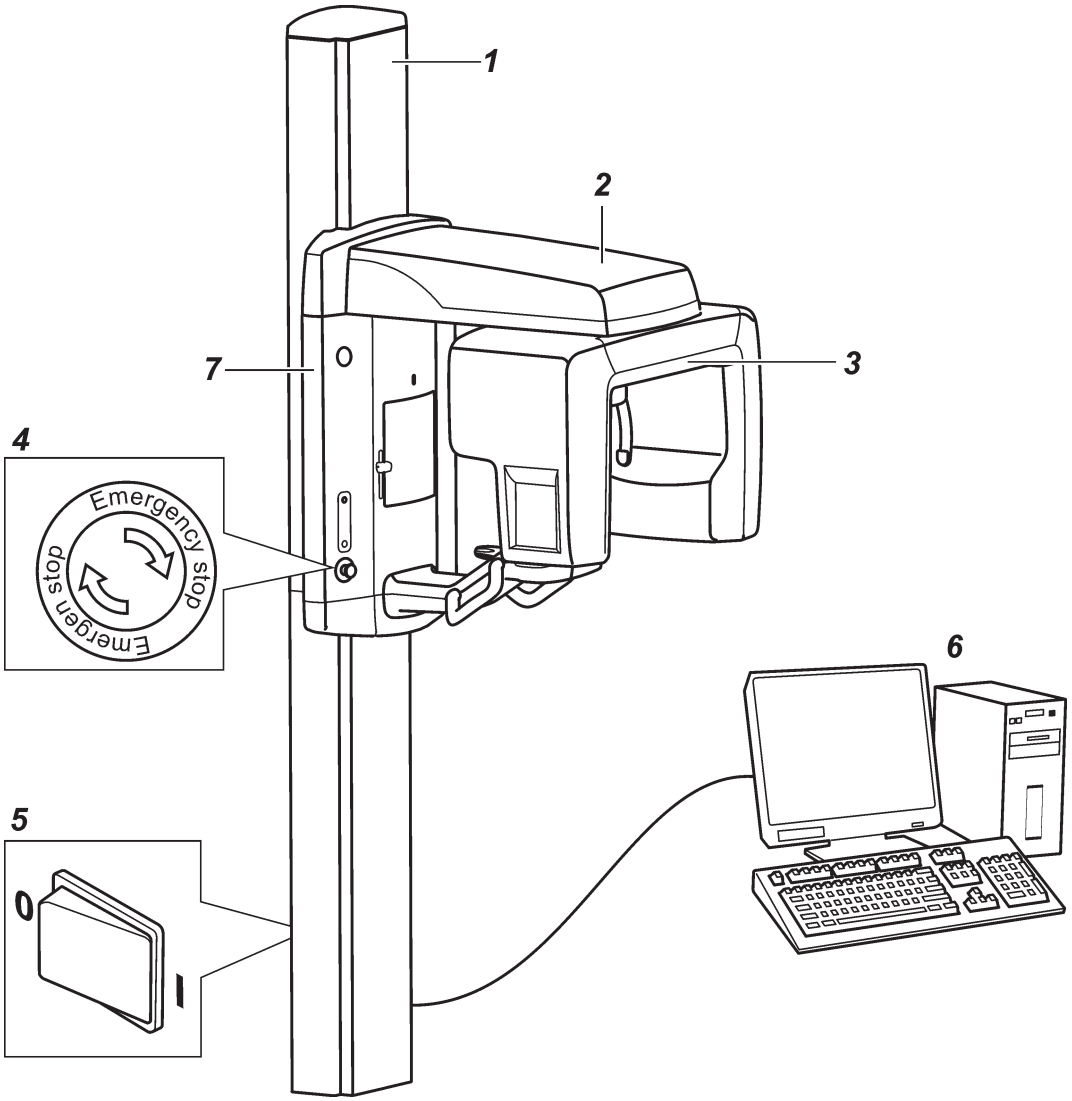
## 1.4 Unit description

### Main parts




1 Column
2 Upper shelf
3 Rotating unit
4 **Emergency stop button** - Press to stop, rotate to release.
5 On / off switch (rear of column)
6 PC with MDD compliant dental imaging software
7 Motorized carriage



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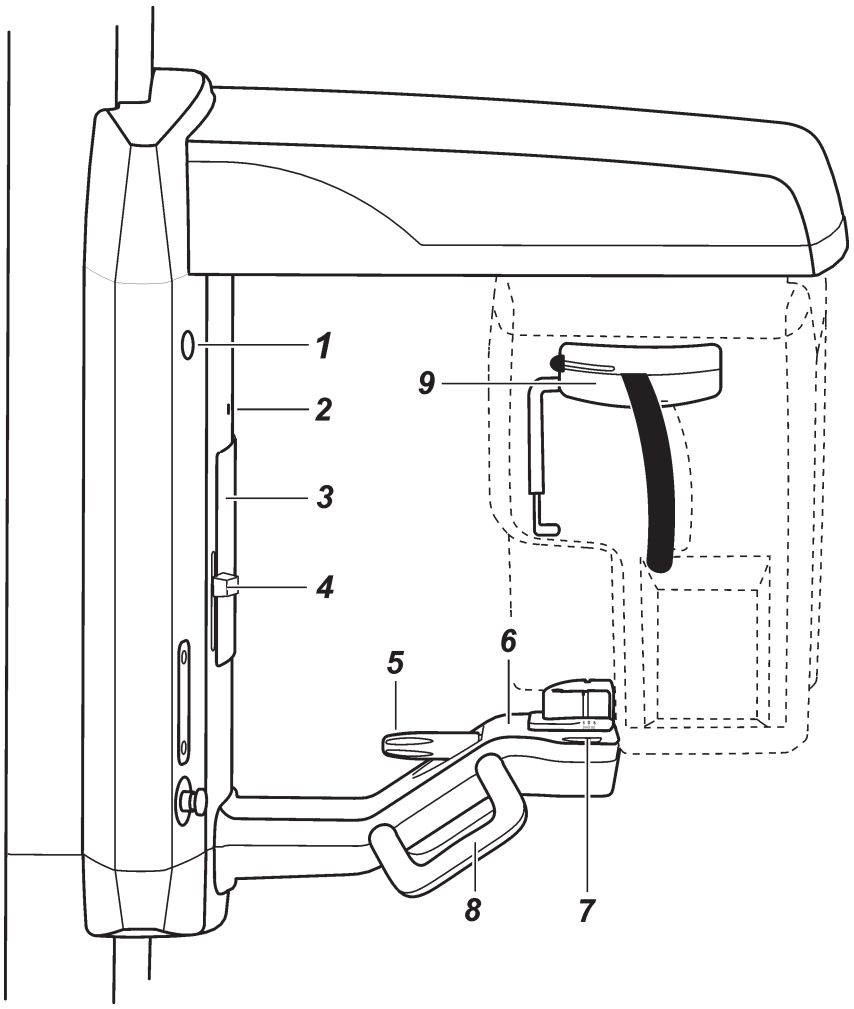


1 Exposure warning light
2 Midsagittal light
3 Mirror
4 Frankfort light and light positioning knob
5 Focal trough positioning knob
6 Patient support
7 Focal trough light
8 Patient support handles
9 Head support



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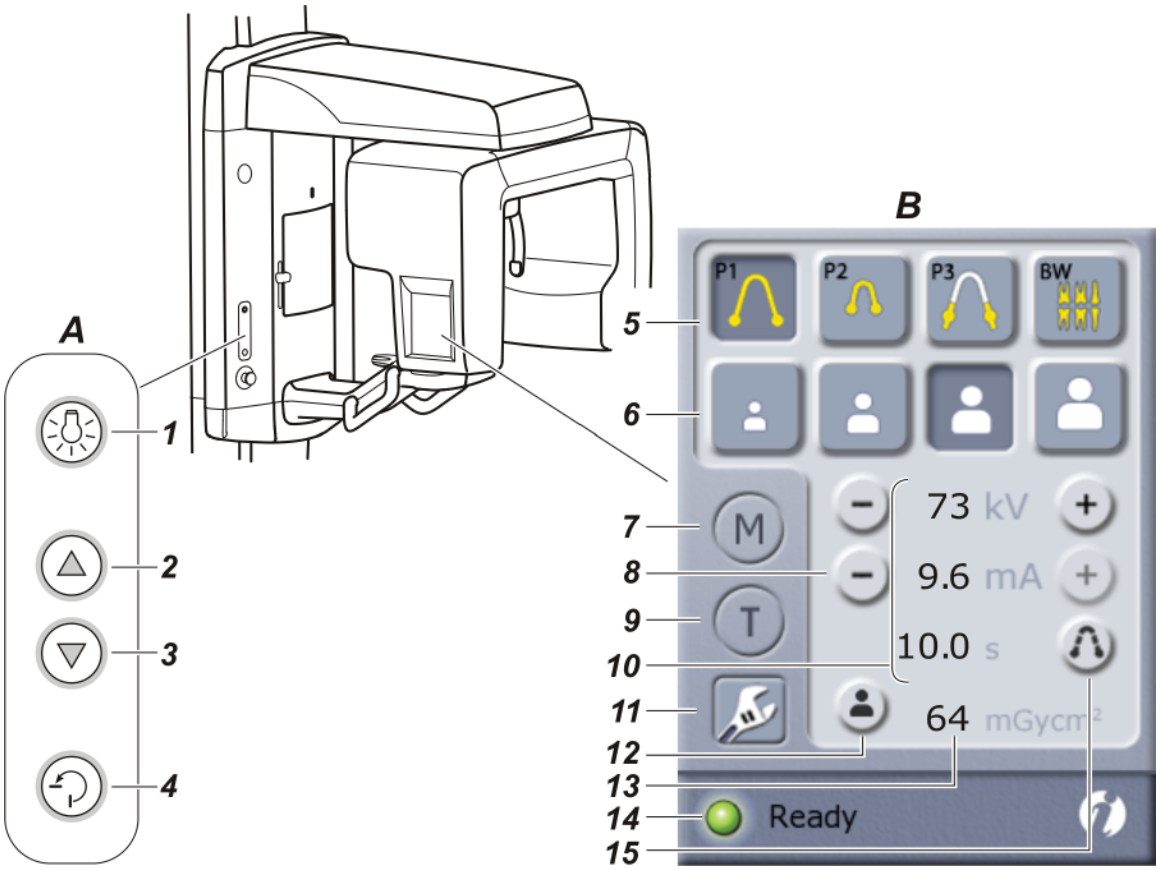
## Unit controls




**A. Side control panel**

1 Lights key - switches the patient positioning lights on and off
2 Up key - drives the unit up
3 Down key - drives the unit down
4 Return key - drive the unit to the patient in/out position (PIO)

**B. Main control panel**

5 Program selection keys:
- P1 = Standard Pan, P2 = Pediatric Pan, P3 = TMJ, BW = Bitewing

6 Patient size selection keys:
- Child, Juvenile, Adult, Large adult

7 Manual (M) mode selection key
8 kV and mA selection keys, manual mode only
9 Test key - operates the unit without x-rays
10 Exposure values
11 Service key
12 Patient Name -key (visible only if patient name display is supported by the dental imaging software)
13 Dose Area Product (DAP)
14 Unit status indicator
15 Segmented panoramic program selection key



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## 1.5 Disposal of the transportation packaging

The unit is transported in a corrugated cardboard box that is attached to a wooden pallet.
Inside the box preformed expanded polystyrene packaging material protects the unit from shock and damage.

| **Packaging material** | **Weight (kg)** | ***(lb)*** |
|---|---|---|
| Cardboard box and lid | 21.0 | *46.3* |
| Wooden pallet | 7.4 | *16.3* |
| Expanded polystyrene | 7.6 | *16.8* |
| **Total weigh** | **36.0** | *79.4* |

When disposing of the transportation packaging materials make sure that you follow all local, national and international regulations regarding the correct and safe disposal and/or recycling of these materials.

In some countries the above transportation packaging materials may be considered to be non-environmentally friendly. If this is the case, the transportation packaging materials must be disposed of in accordance with all local, national and international regulations regarding the disposal of non-environmentally friendly materials.

**NOTE:**
It is advisable to keep some transportation packaging so that units can be repacked and easily and safely moved to new locations if required.



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# 2. Pre-installation requirements

## 2.1 The Unit

- The unit is supplied in one box on a pallet. The dimensions of the box with pallet are:-

| Length | Width | Height |
|---|---|---|
| 191 cm | 85 cm | 103 cm |
| *76″* | *34″* | *41″* |

- The assembled unit weighs 120 kg *(265 lb)*. Make sure that the floor where the unit is to be installed can support this weight.

- The unit MUST be permanently attached to the wall. It is strongly recommended that the base of the column is permanently attached to the floor. If it is not possible, use the exhibition stand. See section **6. The exhibition stand**.

- If the area where the unit is to be installed is subject to earthquakes, the unit MUST be permanently attached to the wall AND the base of the column MUST be permanently attached to the floor. If the base of the column cannot be permanently attached to the floor, use the exhibition stand. Refer to section **6. The exhibition stand**.

- The fixing hardware (not supplied) for attaching the **unit to the wall/floor** and the fixing hardware (not supplied) for attaching the **remote exposure switch to the wall** must be the correct type for the wall/floor materials. See section **2.6 Fixing hardware** for information on fixing hardware.



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- Make sure that the fixing hardware to be used to attach the unit to the wall and the wall itself can withstand a continuous pull-out force of at least 300 kg *(660 lb)*.

- If the wall is made of thin material, you may have to use a reinforcing plate on the rear side of the wall to hold the fixing hardware.

- If the wall is not strong enough to support the unit or if you are not sure if the wall will support the unit, use the exhibition stand.

- The place where the unit is to be installed and the position from where the user will take exposures must be correctly shielded from the radiation that is generated when the unit is operated. Since radiation safety requirements vary from country to country and state to state it is the responsibility of the installer to ensure that all safety requirements are met.

- Do not install the unit in environments where there are corrosive or explosive vapours.

- Special steps regarding EMC need to be taken when installing the unit. For more information refer to the EMC declaration in the User Manual.

- The unit must be installed at least 1.85 m (*73″*) away from any non-medical electrical or electromechanical equipment.

- The unit must be connected to its own dedicated power supply:
  - 100 to 120 VAC or
  - 220 to 240 VAC

- Extension cables MUST NOT be used with the unit.



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## 2.2 The PC

- The PC to be used with the unit must be installed in a location that meets all local and national safety requirements with regards the connection of a PC to an x-ray device.
- The connection of the unit to the PC must meet EN60601-1 requirements. The PC must be positioned at least 1.85 m *(73″)* away from the unit.
- The use of ACCESSORY equipment not complying with the equivalent safety requirements of this equipment may lead to a reduced level of safety of the resulting system. Consideration relating to the choice shall include:
  - use of the accessory in the PATIENT VICINITY
  - evidence that the safety certification of the ACCESSORY has been performed in accordance to the appropriate IEC 601-1 and/or IEC 601-1-1 harmonized national standard.

## 2.3 The dental imaging software

The dental imaging software, for example CLINIVIEW software, that is installed in the PC used with the unit must be MDD compliant.

## 2.4 Space requirements

When installing the unit make sure that:

- there is enough space at the front and sides of the unit to allow patients to enter and exit the unit easily. Patients in wheelchairs will require more space than standing patients.
- the unit is positioned at least 1.85 m *(73″)* away from any non-medical electrical or electromechanical equipment.
- the unit is positioned so that the operator, when protected from radiation, can see and hear the patient during an exposure.



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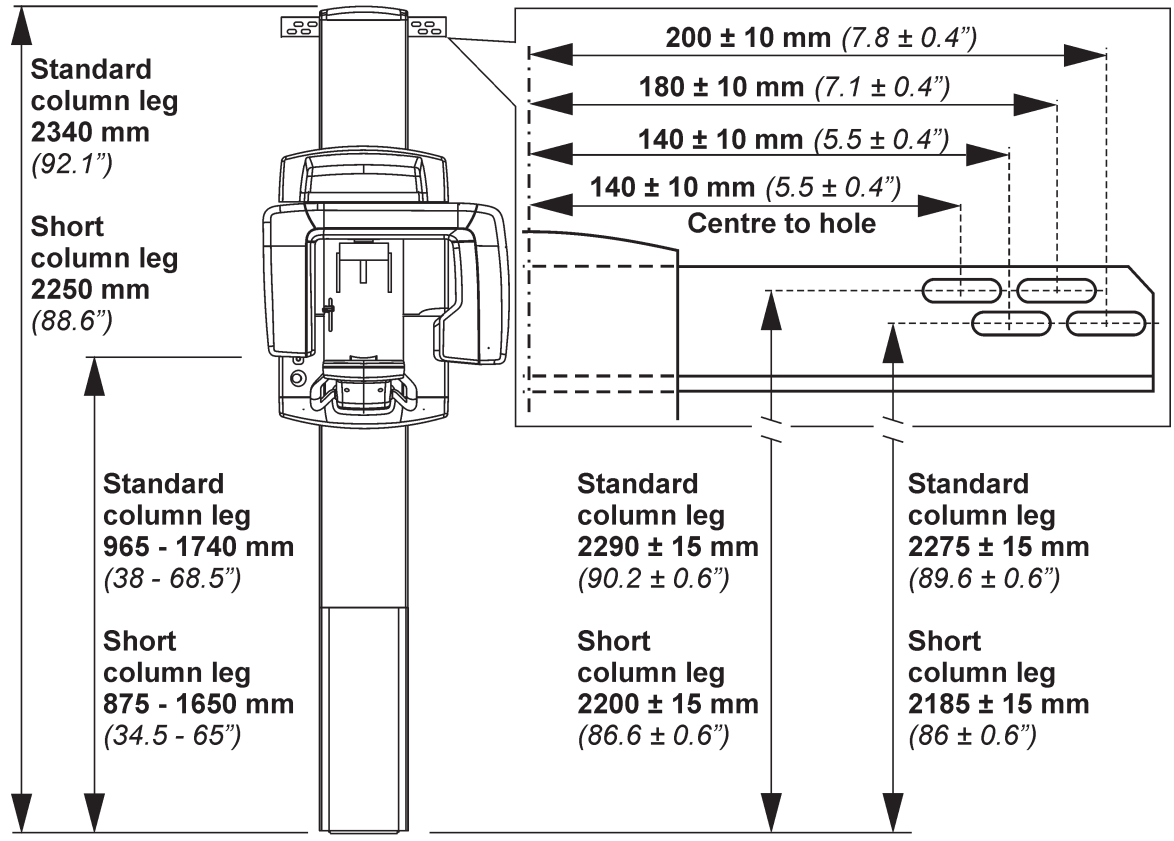
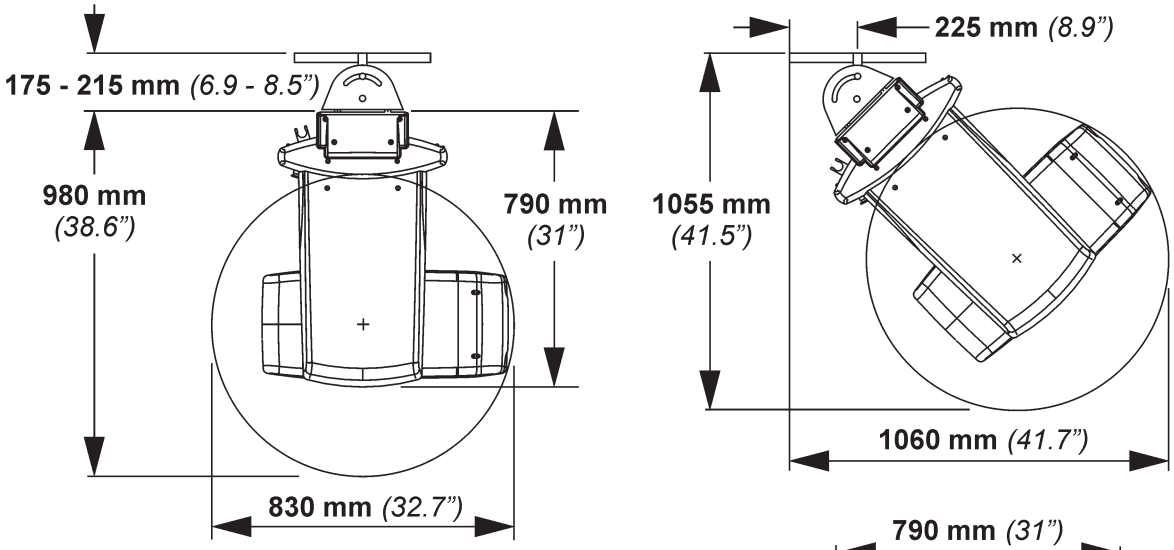
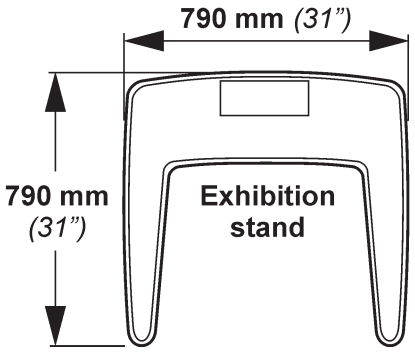
## 2.5 Unit and fixing hole dimensions


Standard column leg 2340 mm (92.1")
Short column leg 2250 mm (88.6")
200 ± 10 mm (7.8 ± 0.4")
180 ± 10 mm (7.1 ± 0.4")
140 ± 10 mm (5.5 ± 0.4")
140 ± 10 mm (5.5 ± 0.4")
Centre to hole
Standard column leg 965 - 1740 mm (38 - 68.5")
Short column leg 875 - 1650 mm (34.5 - 65")
Standard column leg 2290 ± 15 mm (90.2 ± 0.6")
Short column leg 2200 ± 15 mm (86.6 ± 0.6")
Standard column leg 2275 ± 15 mm (89.6 ± 0.6")
Short column leg 2185 ± 15 mm (86 ± 0.6")




**The height of the unit on the exhibition stand is the same as the height of the unit with the standard column leg 2340 mm** *(92.1")*



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## 2.6 Fixing hardware and installation and setup tools

The following tools and hardware are required to install and set up the unit.

**NOTE:**
Fixing hardware and tools are NOT supplied with the unit.

### Fixing hardware for the unit

**WALL** attachment requires:

- 10 mm *(3/8")* diameter fixing hardware, two sets.

**FLOOR** attachment requires:

- 8 mm *(5/16")* diameter fixing hardware, two sets.

**NOTE**:
DO NOT use smaller diameter fixing hardware.

The type and length of hardware to be used will depend on the wall material and floor material to which the unit is to be attached.

Make sure that you use the correct fixing hardware for the wall material and the floor material.

**NOTE**:
Fixing hardware is not required if the exhibition stand is used without wall attachment. See section **6. The exhibition stand** and the separate **instructions** supplied with the exhibition stand.

### Fixing hardware for the remote exposure switch

**WALL** attachment requires:

- 3 mm *(1/8")* diameter fixing hardware, two sets.

**NOTE**:
DO NOT use smaller diameter fixing hardware.



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## Installation tools

- Electric drill
- Spanners (wrenches) 7, 10, 17 (two) mm AF
- Hexagon socket wrenches (Allen keys) 1.5 - 8 mm
- Slot blade screwdrivers 0.5 x 3mm, 0.6 x 3.5
- Torx screwdrivers T20, T25, T30
- Spirit level
- Pliers and wire cutters
- Scissors / Knife
- Transportation wheels (Optional)

## Calibration and setup tools

- Ball and Pin Phantom
- Laser alignment tool
- Image quality test tools (Digital test tool and copper filter) where use of this calibration tool is required. (To be ordered separately)



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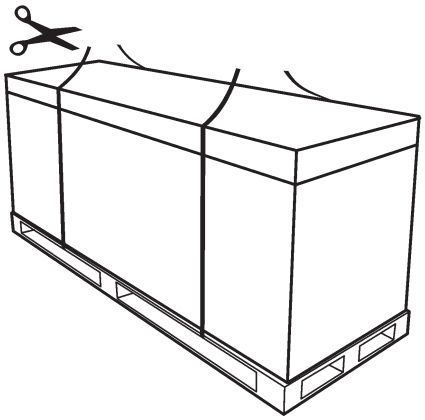
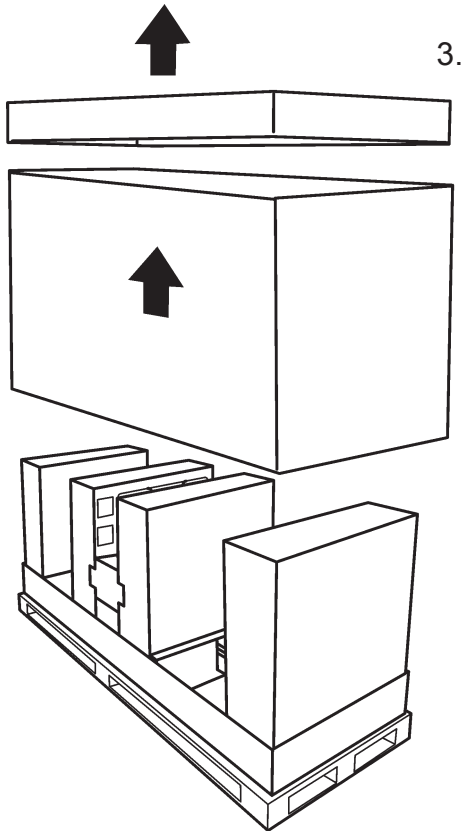
# 3. Installing the unit

## 3.1 Preparing the unit for installation

1. Transport the boxed unit to the location where the unit is to be installed.



2. Remove the straps that hold the box to the pallet.



3. Lift off the top of the box and then the sides.



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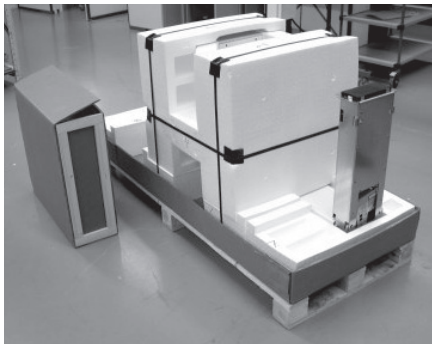
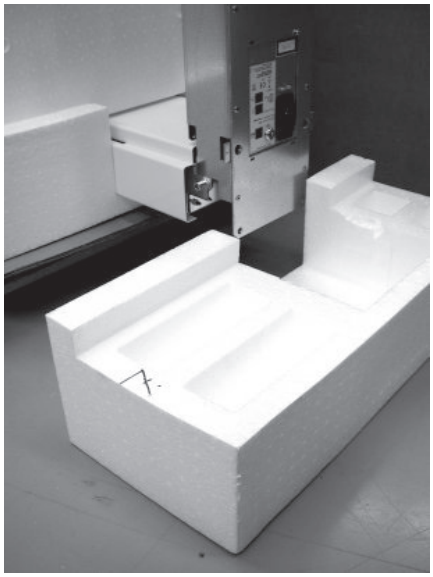


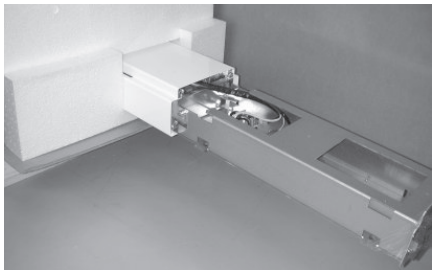
4. Remove all the accessories, the accessory box and as much packaging material as possible.

**NOTE:**
DO NOT remove the packaging material that protects the upper shelf and the rotating unit.

**NOTE:**
If the unit is to be attached to the exhibition stand, see section **6. The exhibition stand** and the separate **instructions** supplied with the exhibition stand.



5. Fold down the end of the box that is nearest the hinged section of the column and then slide the unit over the edge of the pallet so that you can access the underside of the hinged section of the column.



6. **Support the hinged column section before loosening the screws that hold it to prevent it falling and causing injury or damage.**
Loosen the two nuts (M10, inside the column) that hold the hinged lower column section in the vertical transportation position.
Lower the hinged column section down so that it is horizontal. Secure it in position with the two screws supplied (M10 x 16), the fixing holes are on the underside (rear) of the column

Retighten the two nuts (M10, inside the column).



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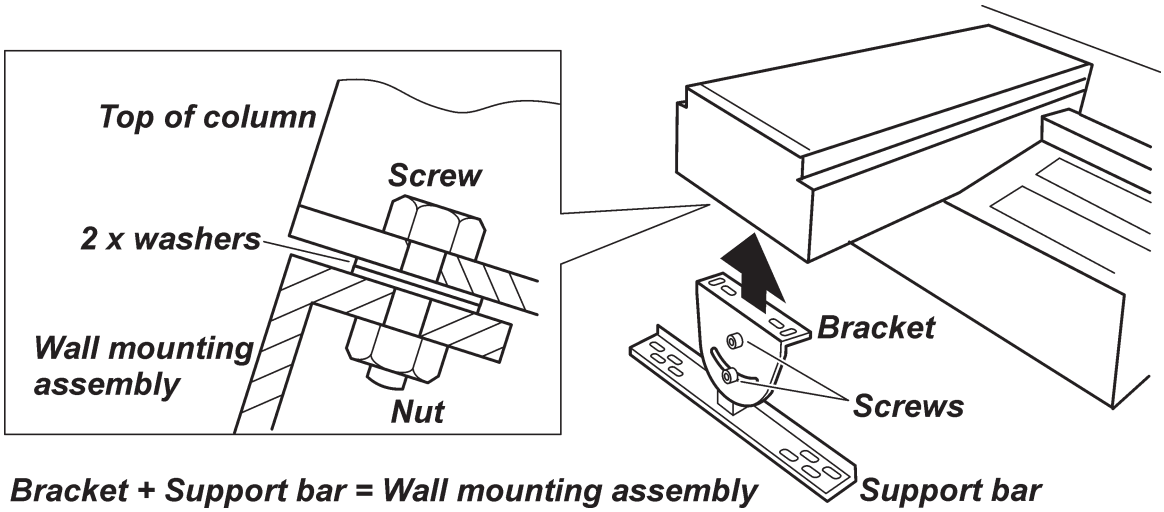
7. Lift the top of the column and slide the packing piece that supported it underneath so that you can access the underside of the column.

   Attach the wall mounting assembly to the back of the column with the screws, nuts and washers supplied (M10).

   **NOTE:**
   The 4 x M10 washers must be positioned BETWEEN the wall mounting assembly and the rear of the column.




***Bracket + Support bar = Wall mounting assembly***

The wall mounting assembly is adjustable so that the unit can be adjusted in the backwards/forwards direction. Make sure that the wall mounting assembly is in the mid position of its adjustment range.
To adjust, loosen the two screws that hold the bracket part of the wall mounting assembly (attached to the column) to the support bar (to be attached to the wall) and position it to the mid position. Retighten the screws.



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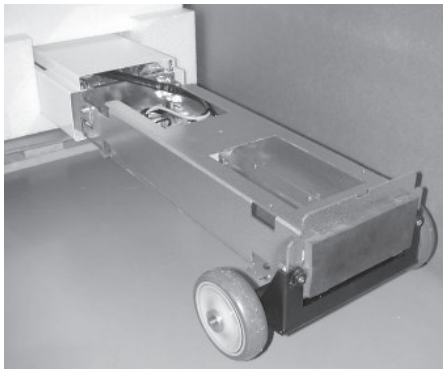
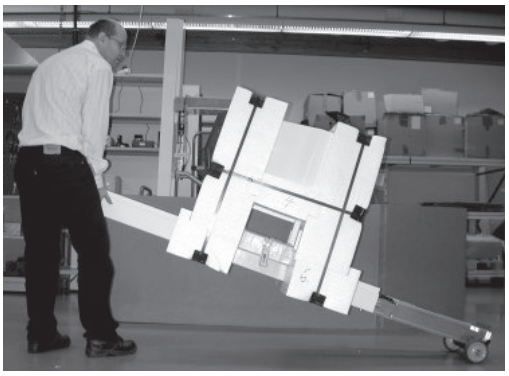
## 3.2 Attaching the unit to the wall

**CAUTION - HEAVY OBJECT**
**A minimum of two persons are required for the following task.**

1. Transport the unit to the place where it is to be installed.

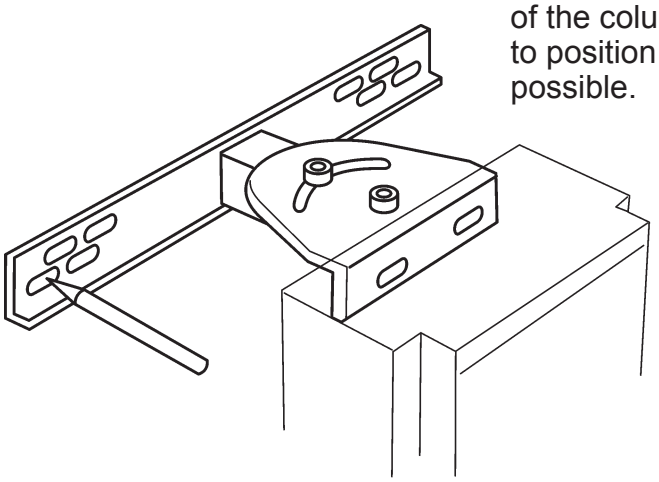


**NOTE:**
The transportation wheels (optional) are attached to the base of the column with two M10 screws. The transportation wheels can be used to wheel the unit to the place where it is to be used.



2. Mark the position of the two fixing holes on the wall according to the dimensions given in the section **2.5 Unit and fixing hole dimensions**.

   Alternatively, lift the unit into the position where it is to be used and then, using the wall bar as a template, mark the positions where the holes must be drilled. Hold a spirit level on the side of the column and then on the front to help to position the unit so that it is as vertical as possible.





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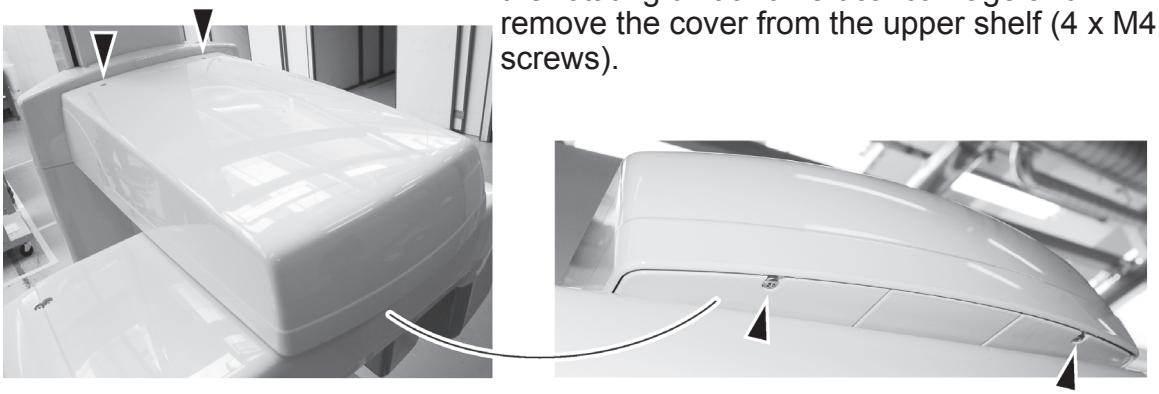
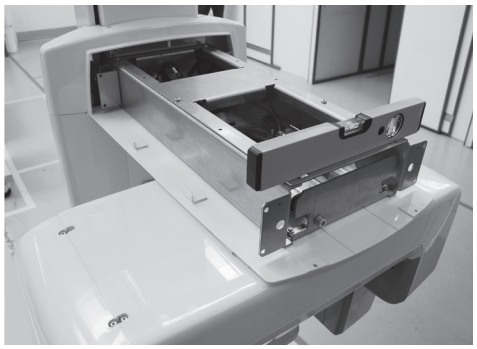
3. Drill two holes with diameters suitable for the 10 mm (*3/8″*) fixing hardware being used and then attach the unit to the wall with the appropriate fixing hardware. Do not fully tighten the screws yet.

4. Remove the packaging material that protects the rotating unit and vertical carriage and remove the cover from the upper shelf (4 x M4 screws).



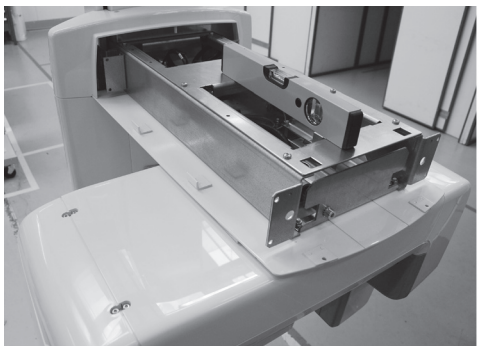
5. Place a spirit level widthwise on the upper shelf and level the unit in the left/right direction.



Make small adjustments by loosening the wall bar fastenings and moving the top of the column to the left or the right to level the unit.

Make large adjustments by moving the base of the column left or right.

6. When the unit is level in the left/right direction place the spirit level lengthwise on the upper shelf and level the unit in the forwards/ backwards direction.



Make large adjustments by moving the base of the column backwards or forwards.



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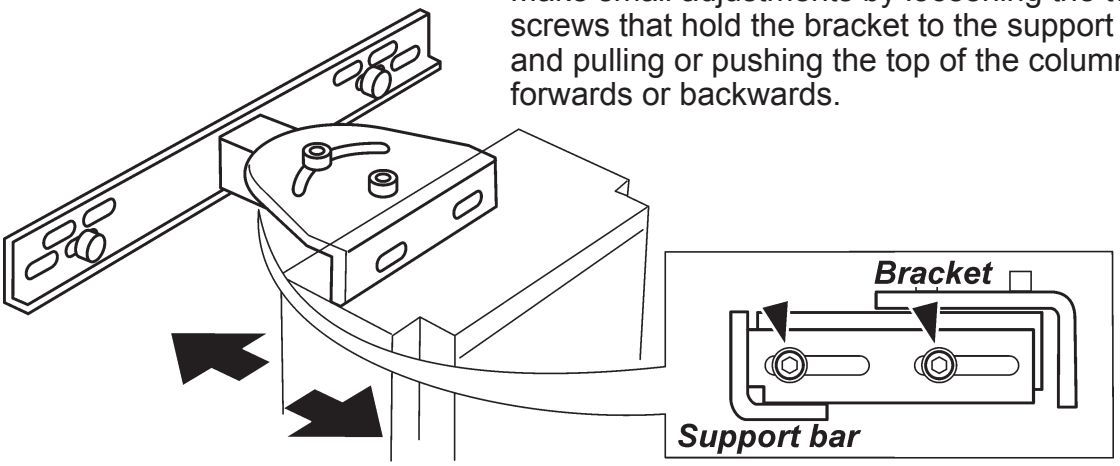
Make small adjustments by loosening the two screws that hold the bracket to the support bar and pulling or pushing the top of the column forwards or backwards.



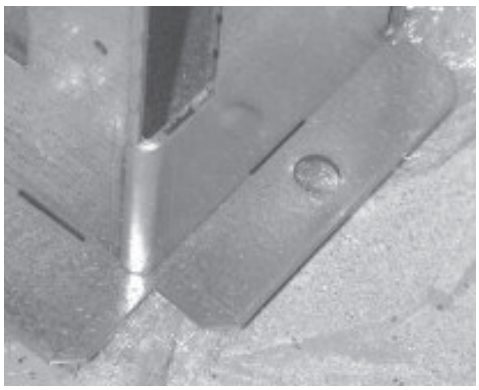

## 3.3 Attaching the unit to the floor

It is recommended that the base of the unit is attached to the floor.

If the unit is being installed in an area prone to earthquakes OR if you think that the wall bracket by itself will not hold the unit rigidly enough to the wall, then the base of the column MUST be fixed to the floor.

**NOTE:**
If the base of the column needs to be fixed to the floor but it is not permitted or possible, use the exhibition stand. See section **6. The exhibition stand** and the separate **instructions** supplied with the exhibition stand.

1. Make sure that the unit is level and then mark the positions of the two fixing holes on the floor.





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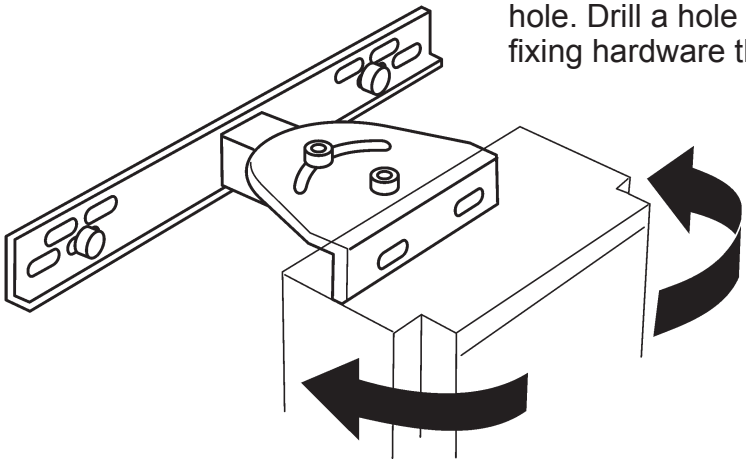
2. Loosen the two screws that hold the bracket to the support bar and rotate the unit to one side so that you can access the mark for the floor hole. Drill a hole suitable for the 8 mm (*5/16″*) fixing hardware that is to be used.



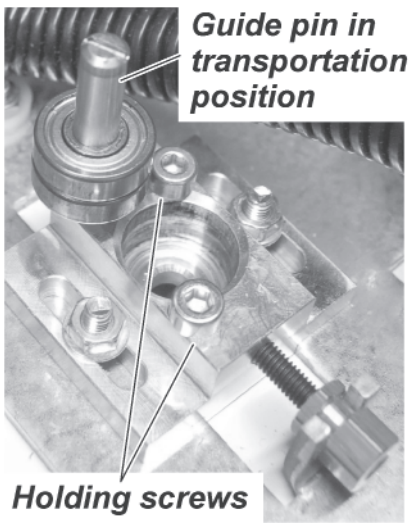
Rotate the unit to the other side and drill the second hole.

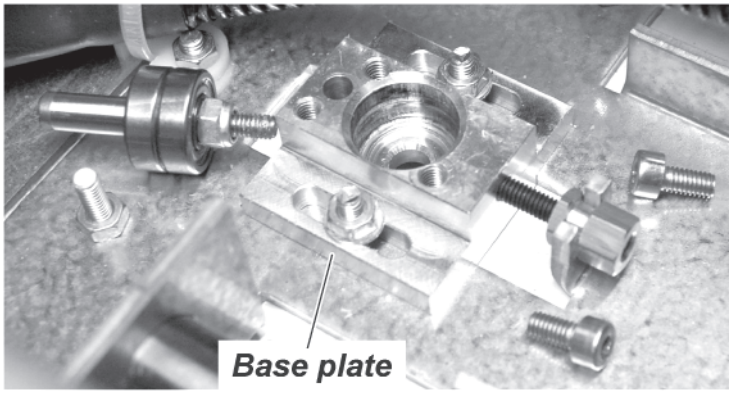
3. Turn the unit back to the original position and then attach the unit to the floor with the fixing hardware.

4. Check once more that the unit is vertical and then tighten all the fixing screws and wall bracket fastenings.

## 3.4 Installing the guide pin

1. From the upper shelf, unscrew the guide pin and two holding screws from the base plate. DO NOT remove the base plate or loosen the nuts that attach it to the unit.



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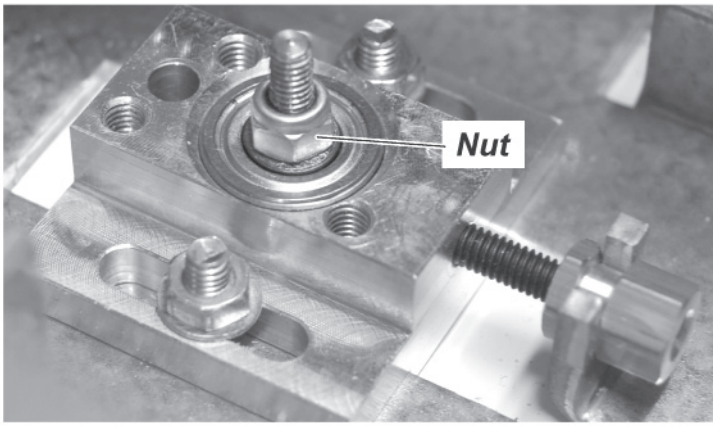
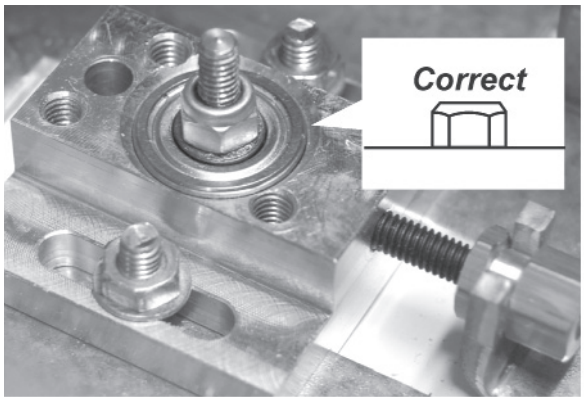
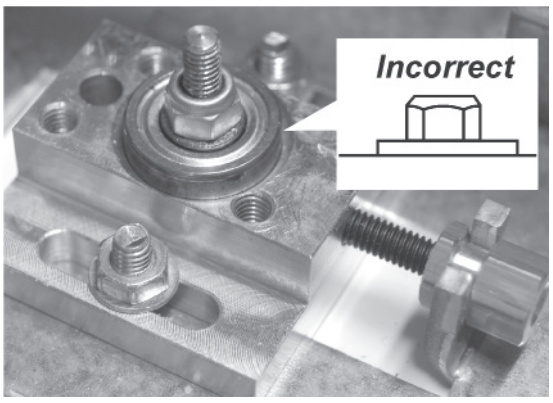
2. Flip the guide pin assembly around so the plain section of the guide pin is downwards and the nut is uppermost. Then insert the guide pin assembly into the hole in the base plate.




**IMPORTANT NOTE:**
If the guide pin does not fully enter the hole in the base plate (the top of bearing is NOT level with the top of the base plate) the rotating unit must be moved slightly.

To do this loosen the transportation screws (see step 4 for information on the transportation screws), and then slide the rotating unit gently backwards or forwards until the guide pin drops into place.



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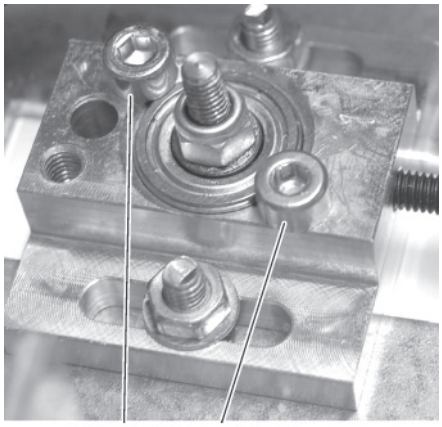
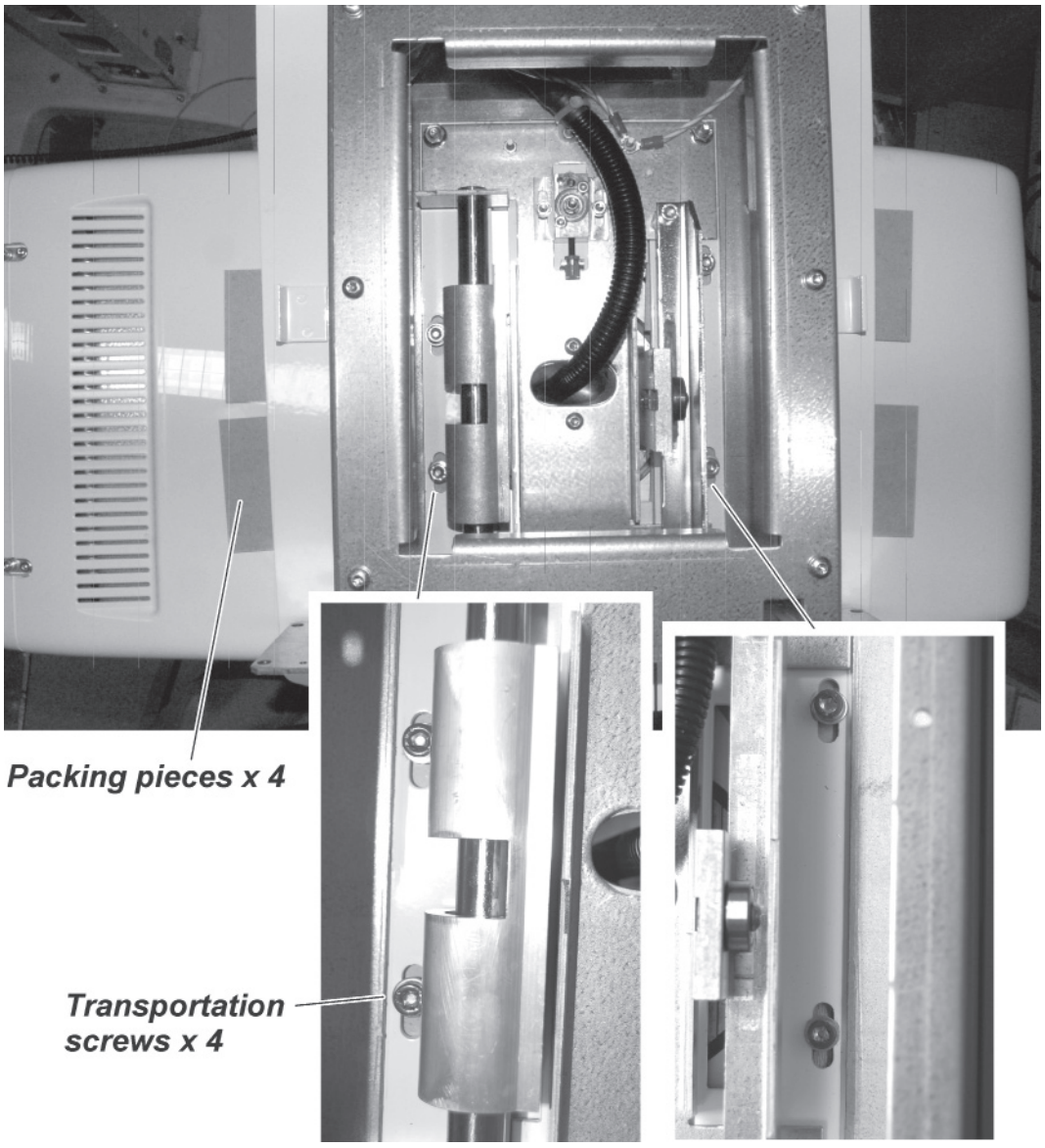


*Holding screws*

3. Secure the guide pin in position with the two holding screws.

4. Remove the four (4) transportation screws (painted RED) and four (4) packing pieces that hold the rotating unit to the upper shelf.

   Now rotate the rotating unit 180° counterclockwise so that the control panel is on the left-hand side (the unit **patient in/out position**).



*Packing pieces x 4*

*Transportation screws x 4*



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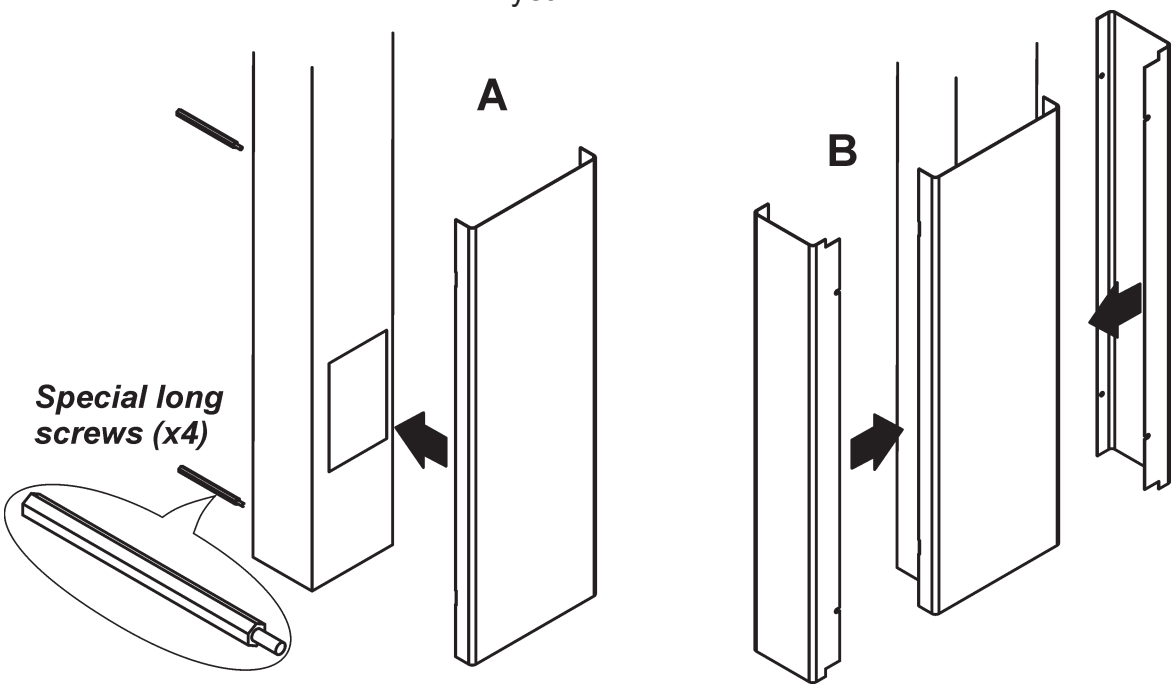
### Unit relocation

If the unit ever needs to be moved or relocated, replace the packing pieces and transportation screws and then remove the guide pin assembly and place it back into its transportation position (step 1) BEFORE removing the unit from the wall or the exhibition stand.

## 3.5 Attaching the covers to the column

1. Attach the covers to the bottom of the column.

   Attach the Front Cover, **A,** to the front of the column with the special long screws (4), they are inserted from the rear. Do not tighten them yet.




   Attach the Side Covers, **B**, to the sides of the column. Note that the front edge of the Side Covers is positioned between the column and the Front Cover. The rear edge is attached to the back of the column with two screws. Tighten all the screws.



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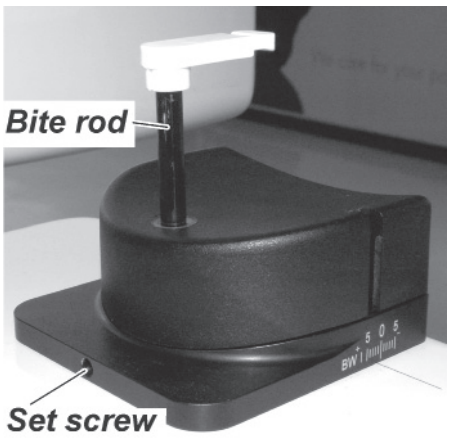
## 3.6 Checking the bite rod




1. Check that the bite rod can be inserted into the chin rest easily and that it stays in position when released. If it is too tight or too loose adjust the tightness with the set screw (slot blade screwdriver 0.5 x 3mm).

## 3.7 Exposure switch

**NOTE:**
If the exposure switch is to be used with the remote option, refer to the section **3.8 Installing the remote exposure switch**.

1. Attach the exposure switch holder to the rear of the vertical carriage on the left-hand side using two (2) screws.

   If the user does not want to have the exposure switch positioned on the unit, attach the exposure switch holder, within the range of the exposure switch spiral cable, to where requested.

   Make sure that the exposure switch is positioned so that the user can protect them self from radiation and can see the patient during an exposure.

2. Connect the exposure switch cable to the connector at the bottom rear of the column and clamp the cable in place using one of the cable clamps. Place the exposure switch on the exposure switch holder.



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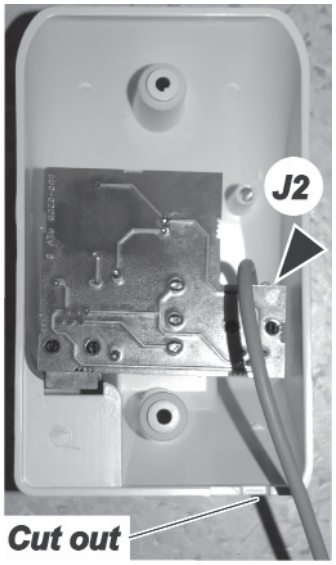
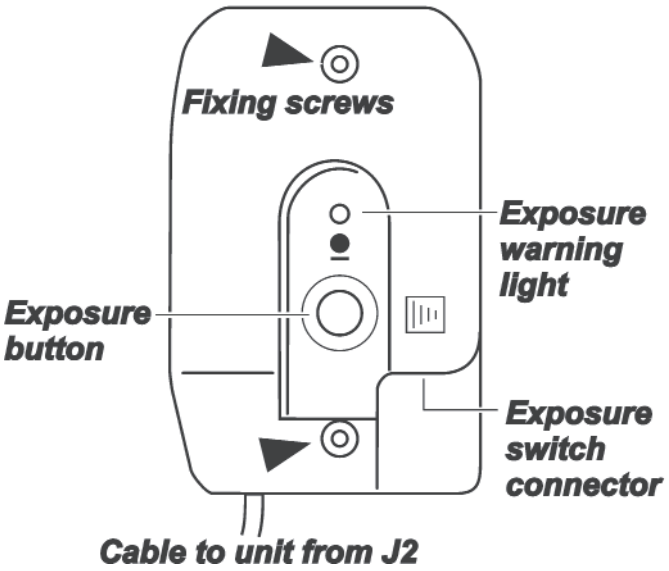
## 3.8 Installing the remote exposure switch

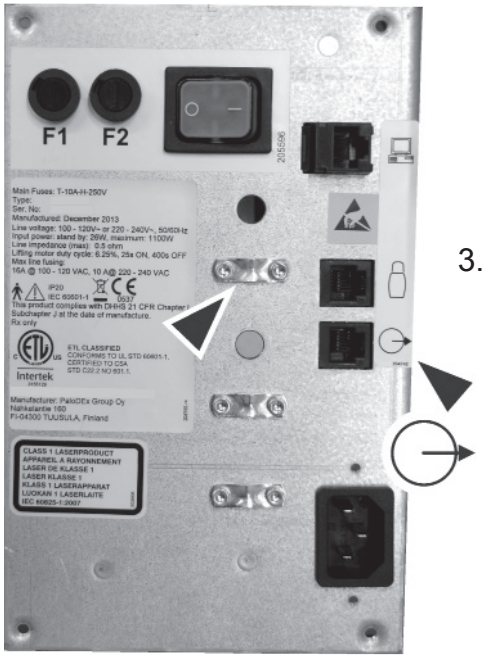
A wall-mountable remote exposure switch with integrated exposure warning light is supplied with the unit. If a remote exposure switch needs to be used, install it as follows:




1. Connect one end of the remote exposure switch extension cable to connector J2 inside the remote exposure switch.

2. Attach the remote exposure switch to the wall in the required position (2 fixing screws). Make sure that the cable from J2 is positioned in the small cut-out in the bottom of the remote exposure switch housing. Also make sure that the cable does not press against the circuit board when the housing is attached to the wall.




3. Route the remote exposure switch extension cable to the rear of the unit and then secure the cable in position under one of the cable clamps after connecting the cable to the unit. This will ensure that the cable cannot be accidentally disconnected.



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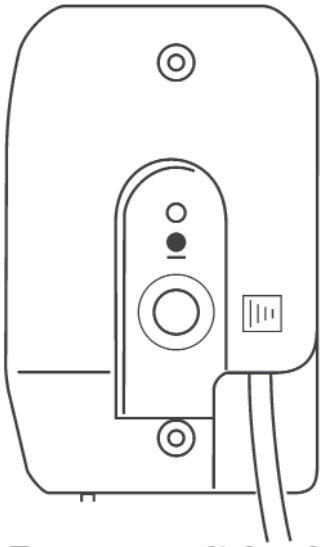

***Exposure switch cable***

4. If the user wants to use the exposure switch with the remote exposure switch option, connect the exposure switch to the appropriate connector on the remote exposure switch. Exposures can be taken either with the exposure switch or with the button on the remote exposure switch.

5. Attach the exposure switch holder, within the extension range of exposure switch spiral cable, to the requested position.

   Make sure that when the exposure switch is used the user can protect them self from radiation and at the same time see the patient during an exposure.



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## 3.9 Connecting the unit to the power supply

The unit must be connected to its own dedicated power supply:

- 100 to 120 VAC or
- 220 to 240 VAC

No other equipment should be connected to the same power supply.

Extension cables **MUST NOT** be used to connect the unit to the power supply.

1. The power supply must be equipped with a circuit breaker:
   - 100 - 120 VAC, min. 16 A 250 VAC
   - 220 - 240 VAC, min. 10 A 250 VAC.

2. Connect one end of the power lead to the back of the unit and the other end to the power supply.
   Observe any national and local electrical requirements with regards the connection of dental x-ray equipment to a power supply.



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## 3.10 Preparing the PC

**NOTE**:

The PC and any other external device(s) connected to the system must meet the IEC 60950 standard (minimum requirements). Devices that do not meet the IEC 60950 standard must not be connected to the system as they may pose a threat to operational safety.

1. Position the PC to be used with the unit at least 1.85 m *(73")* away from the unit.

   **NOTE**:
   If the unit and PC are to be part of a larger dental system or connected to local network, make sure that all the other system components and devices are installed, connected and configured correctly. Refer to the documentation supplied with the other components and devices for information on how to do this.

2. Switch the PC on and install CLINIVIEW software or other dental imaging software that will be used with the device.
   For information on how to do this refer to the documentation supplied with the dental imaging software you are installing.

   **IMPORTANT NOTE**:
   After the dental imaging software has been installed a **Select device** window will appear. Make sure that you select **OP30**.

   **NOTE:**
   If a disk for updating the driver is supplied with the unit, install the driver update after you have installed the dental imaging software.



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## 3.11 Connecting the unit to the PC

The unit supports 10Base-T/100Base-TX Ethernet connections.

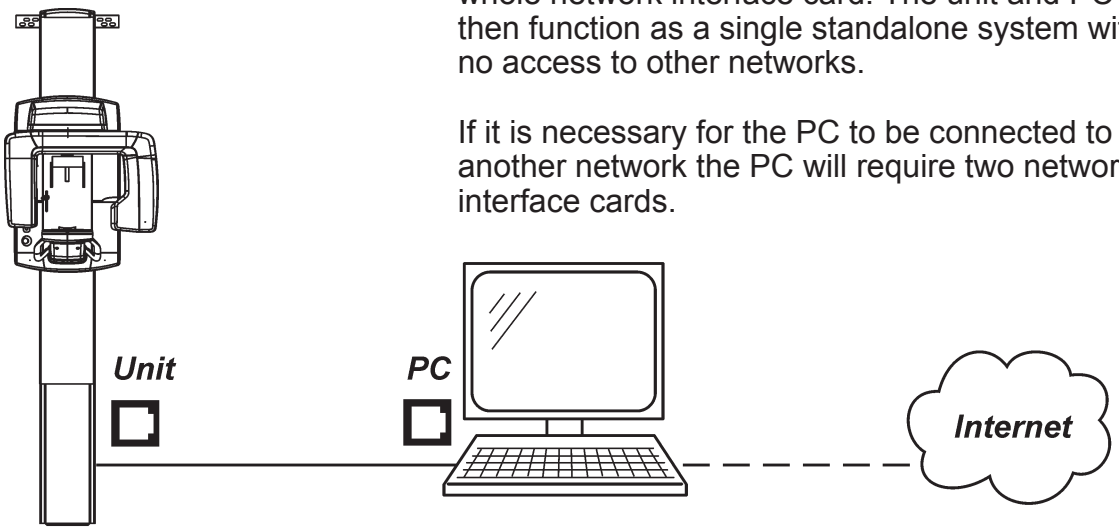
The PC must be connected to the unit in accordance with IEC 60601-1-1.

### Connection options

#### Standalone

With the standalone configuration the unit is connected to a PC, and the unit then reserves the whole network interface card. The unit and PC then function as a single standalone system with no access to other networks.

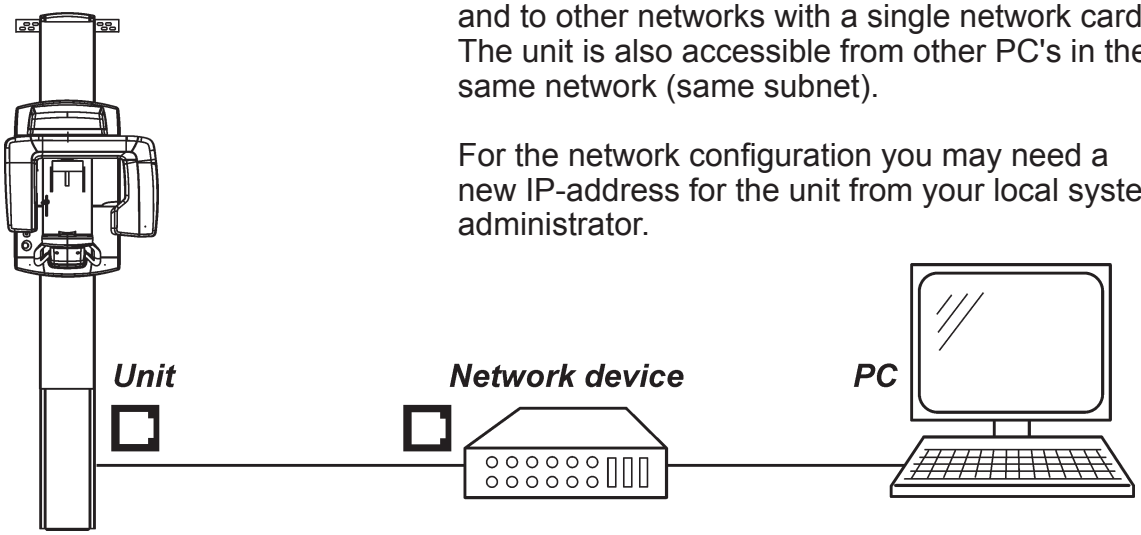
If it is necessary for the PC to be connected to another network the PC will require two network interface cards.




#### Network

With the network configuration the unit is connected to the PC via a network device. With this configuration the PC is connected to the unit and to other networks with a single network card. The unit is also accessible from other PC's in the same network (same subnet).

For the network configuration you may need a new IP-address for the unit from your local system administrator.



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## Connection methods

The unit can be connected to the PC in two ways, **Direct connection** or **IP based connection**. Both of these connection methods allow the unit to be used in either a Standalone or a Network Configuration.

## Direct Connection

Direct Connection is a connection method based on the unit serial number for establishing a connection between the unit and the PC. Direct connection is not based on IP protocol but instead utilizes a proprietary Ethernet protocol.

**NOTE:**
In some configurations the PC firewall or other network devices may prevent direct connection from operating. Direct connection requires traffic to be allowed between the PC and unit through the network devices and the PC firewall in the inbound/outbound direction for Ethernet protocol ID 0x6000. If there are difficulties with the direct connection use the IP based connection method instead.

## IP based connection

IP based connection uses IP Protocol to establish a connection between the unit and the PC. It requires the IP-addresses of both the unit and the PC to be configured correctly.

**IMPORTANT NOTE**:
The default IP-address of the unit is: 194.9.227.251 and the subnet mask is fixed to 255.255.255.0.

The unit offers two alternatives for configuring its IP-address, **Remote** and **Manual**. With the **Remote** alternative the unit receives its IP-address from the PC. With the **Manual** alternative the user sets the IP-address of the unit using the Graphical User Interface (GUI) of the unit.
It is recommended that **Remote** alternative is used when configuring the IP-address of the unit. However, if problems occur, due to firewalls etc., use the **Manual** alternative instead.



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The **Remote** alternative is explained as part of the section **Connection using IP based connection method**.
The **Manual** alternative is explained in section **Manually changing the IP-address**.

**IMPORTANT NOTE**:
The unit can have any IP-address but the unit and PC must always be in the same subnet. For example IP for PC 194.9.227.250 and IP for the unit 194.9.227.251 and the subnet mask is fixed to 255.255.255.0.



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## Connection using the Direct Connection method

1. **Standalone configuration**:
   Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the PC.

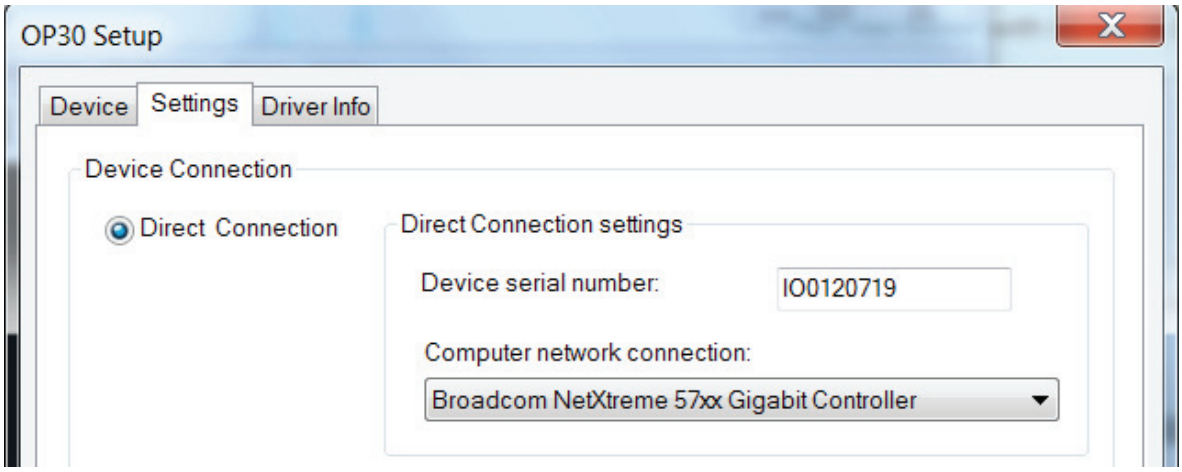
   **Network configuration**:
   Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the network.

2. Switch the Unit on.

3. **PC**: Start the PC. Then open CLINIVIEW software or the dental imaging software that was installed previously and select **Settings**:

   - **CLINIVIEW** software**:** Select **Tools** / **OP30 Settings** and then the **Settings** tab.

4. **PC**: In the **Device Connection** section, click the **Direct Connection** radio button and then key in the complete device Serial Number (it is on the type label) into the **Device serial number** field.




Select the correct Nertwork Interface Card (NIC) from the **Computer network connection** drop down list.



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**NOTE:**
If there is more than one NIC in the PC make sure that you select the one that is connected to the device.

Click **OK** to save the settings.

5. The unit will automatically connect to the PC within 5-15 seconds.



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## Connection using the IP based method

1. **Standalone configuration:** Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the PC.

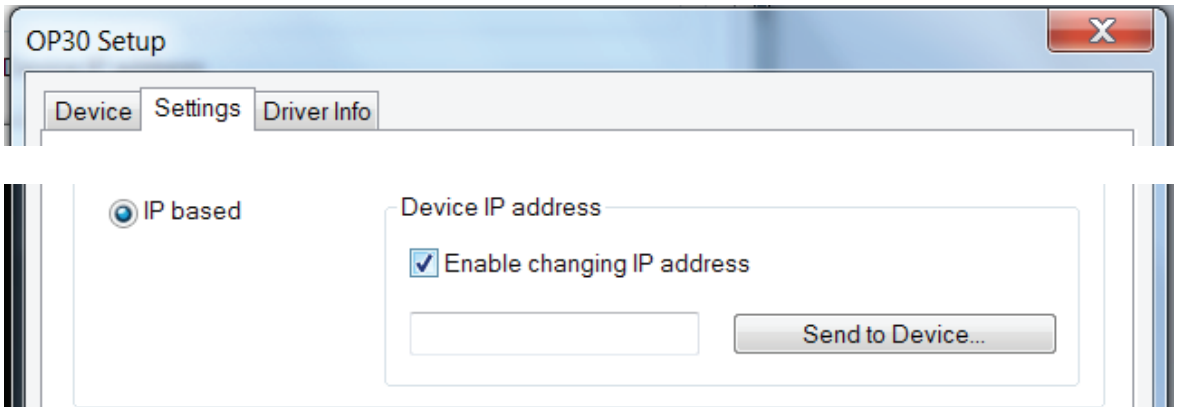
   **Network configuration:** Connect one end of the Ethernet cable to the unit (the connector at the rear of the column) and the other end to the network.

2. Switch the Unit on.

3. **PC**: Start the PC. Then open CLINIVIEW software or the dental imaging software that was installed previously and select **Settings**:

   - **CLINIVIEW** software**:** Select **Tools** / **OP30 Settings** and then the **Settings** tab.

4. **PC**: In the **Device Connection** section, click the **IP based** radio button to select it and then click the **Enable changing IP-address** check box to activate the IP-address field.



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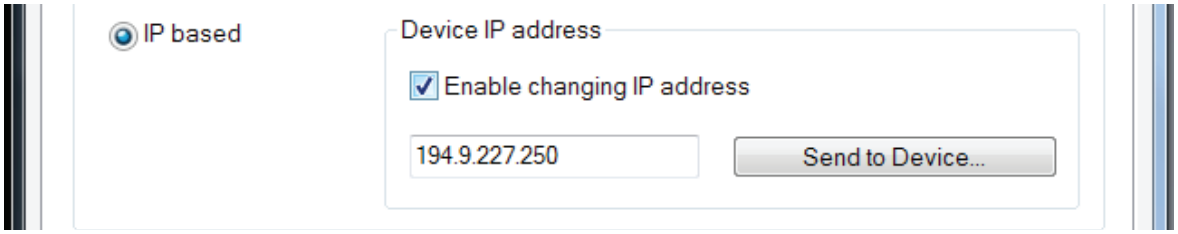
5. **Stand alone configuration**:
   **PC**: Key in the desired IP-address of the unit, for example 194.9.227.250, into the IP-address field.

   **Network configuration**:
   **PC**: Key in the new IP-address (obtained from the network administrator) into the IP-address field.




**IMPORTANT NOTE**:
The unit can have any IP-address but the unit and PC must always be in the same subnet. The subnet mask of the unit is fixed to 255.255.255.0.

**NOTE**:
With the **network configuration** the default IP-address of the unit must be changed to the IP-address obtained from your local IP administrator.

With **standalone configuration** you can avoid changing the IP-address of the unit by setting the IP-address of the PC to the same sub net as the default value of the unit. After changing the PC IP-address in this way, and entering the default or current IP-address of the unit into the IP-address field, as instructed above, you can proceed to step 12 to finish the configuration.

6. Touch the service key on the main control panel of the unit.



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7. The configuration screen will appear. It shows the unit serial number and the firmware version numbers.

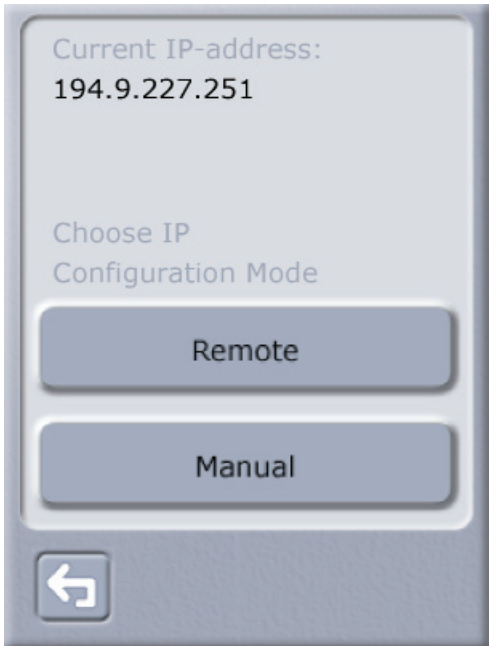
Also there are three function keys, **IP Settings**, **Installation** and **QA**.

Select **IP Settings**

**NOTE:**
See section **4.1 Checking alignment of the beam and the CCD sensor** for information about **Installation**.

See section **4.4 Quality Assurance test** for information about **QA**.

8. The IP configuration screen, with two configuration mode function keys; **Manual** and **Remote**, will appear.




Select **Remote**.



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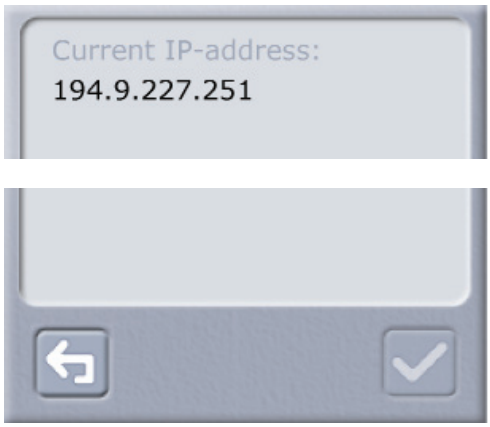
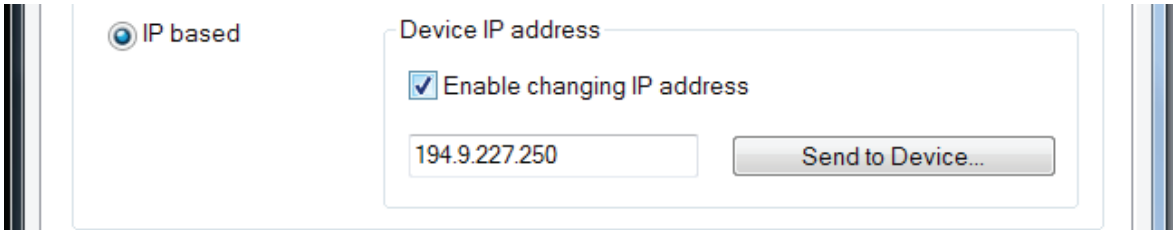
9. The IP-address screen will appear, which shows the current IP-address of the unit.




10. **PC:** Press the **Send to Device…** button.




11. The new IP-address will appear on the display.

Touch the **OK** key to accept the IP-address and then the **Arrow** key to return to the main screen.

12. **PC:** Click the OK button to close the settings window.

**NOTE:**
If the remote IP-address setting fails use the MANUAL method. See section **Manually changing the IP-address**.



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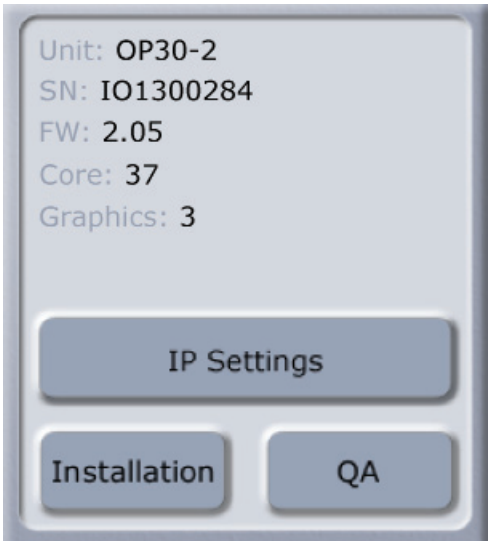
## Manually changing the IP-address

The IP-address of the unit can be changed manually.

**NOTE**:
Always set the IP-address of the PC before changing the IP-address of the unit.

1. Touch the service key on the main control panel of the unit.



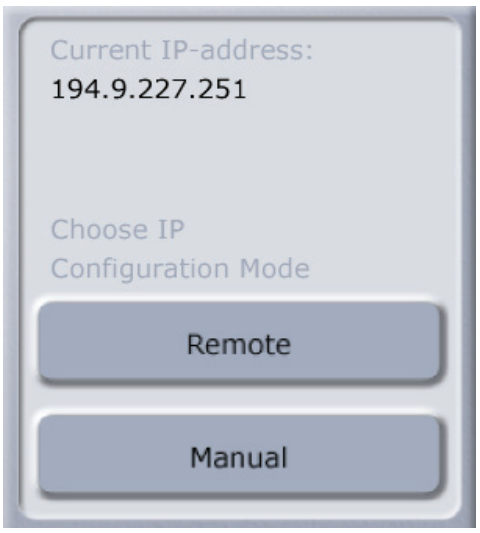

2. The configuration screen will appear. It shows the unit serial number and the firmware version numbers.

   Also there are three function keys, **IP Settings**, **Installation** and **QA**.

   Select **IP Settings**

   **NOTE:**
   See section **4.1 Checking alignment of the beam and CCD sensor** for information about **Installation**.

   See section **4.4 Quality Assurance test** for information about **QA**.




3. The IP configuration screen, with two configuration mode function keys; **Manual** and **Remote**, will appear.

   Select **Manual**.



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4. The Manual IP-address configuration screen will appear.

Key in the new IP-address.

When the new IP-address has been keyed in the **OK** (tick) key will become active.

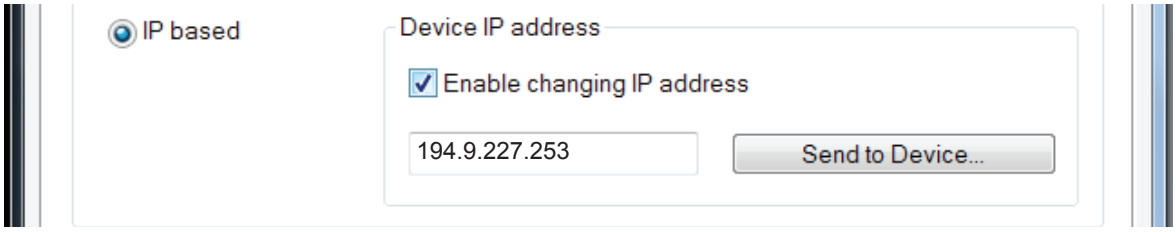
Touch the **OK** (tick) key to accept the change and return to the main screen.

Touch **Arrow** key to discard the change and return to the main screen.

5. **PC**: Start the PC. Then open CLINIVIEW software or the dental imaging software that was installed previously and select **Settings**:

   - **CLINIVIEW** software**:** Select **Tools** / **OP30 Settings** and then the **Settings** page.

6. **PC**: In the **Device Connection** section, click the **IP based** radio button to select it. Then click the **Enable changing IP-address** check box to activate the IP-address field.




7. **PC:** Key in the new IP-address into the IP-address field.

8. **PC:** Click the OK button to close the settings window.



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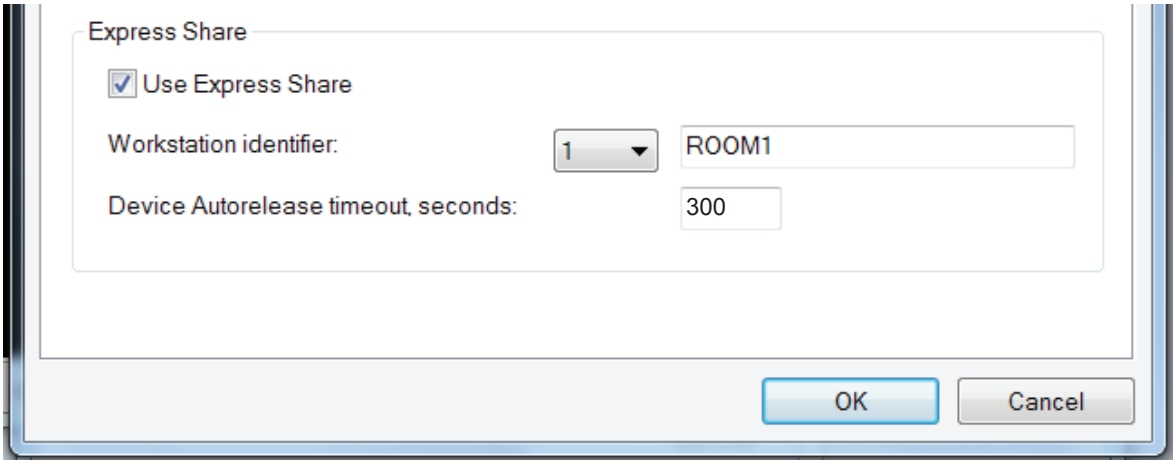
## Express Share

Express Share allows the unit to be used by several PCs within a network. A PC must "reserve" the unit before it can be used.

1. **PC:** In **Tools** / **OP30 Setup** window select the **Settings** page.

2. **PC:** Click the **Use Express Share** check box to select it and then, from the drop down list, select a unique **Workstation identifier** number (between 1 and 8) for the PC being configured.
   Additional workstation information, for example, user name, location etc, can be entered into the field next to the work station identifier number.

   **NOTE:**
   Each PC in the system MUST have a different **Workstation identifier**.




The **Device Autorelease timeout** is the length of time that the unit will remain reserved and usable by a PC. After the set time elapses the PC automatically releases the unit so that it can be used by another PC in the network (the unit can be reserved in advance from another PC).
The default setting is 300 seconds. This can be changed by keying in a new value.



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3. **PC:** Click **OK** to connect the PC to the unit.

   **NOTE:**
   An automatic technique will automatically locate the unit within the local area network and connect the PC.

4. **PC:** Repeat the above process for all the other PCs in the network.
   Make sure that you define the **IP-address** of the unit in each PC and that the **workstation identifier** selected is not used in more than one PC.

5. Check the installation by starting image capture using the imaging software.
   If the **Use Express Share** was selected the Workstation identifier of the PC (1 - 8) being used will appear on the unit display.

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# 4. Checking the alignment and finishing the installation

## 4.1 Checking the alignment of the beam and the CCD sensor

1. **PC:** Prepare the unit for an exposure.

   **NOTE:**
   If the dental imaging software prompts an error message "Please calibrate the device" on startup, perform CCD re-calibration as described in section **5.5 Calibrating the CCD sensor**.

2. Remove the chin rest.

3. Touch the service key on the main control panel of the unit to open the configuration screen.

4. Select **Installation.**

5. The PIN number screen will appear. This is a security feature to prevent the user from accidentally accessing the installation / service commands.

   Key in **1204** and touch the **OK** (tick) key.



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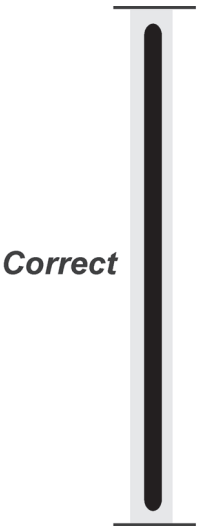
6. The service screen will appear.
   Select **Still Mode**.

7. **Protect yourself from radiation**.
   Press and hold down the exposure switch to take an exposure.

   **NOTE!**
   The rotating unit doesn't move while taking exposures in **Still Mode**.




8. **PC:** Use the dental imaging software to examine the image that appears.

   If the beam and CCD sensor are correctly positioned the image will show a vertical black line (the beam) in the middle of a vertical light gray area (the CCD aperture).

   Both the beam (black line) and the CCD aperture (light gray area) must be vertical and the bottom edge of the beam (black line) must be between 0.1 and 2 mm from the bottom edge of the image.

   If the beam (black line) is too far to the right or left or too high or too low or if the CCD aperture (gray area) is tilted to one side, the CCD sensor and/or the beam must be adjusted. See **5.1 Aligning the CCD sensor** and **5.2 Adjusting the beam**.

9. Touch the **Arrow** key to exit the **Still Mode** and return to the main screen.



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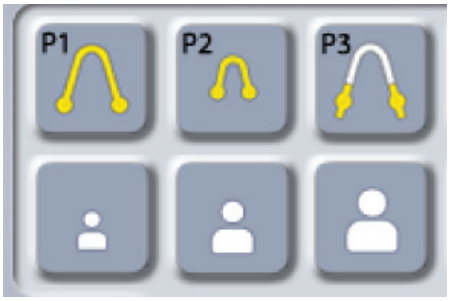
## 4.2 Checking the image geometry (Ball and Pin Phantom test)

1. **PC:** Prepare the unit for an exposure.

2. Reattach the chin rest.

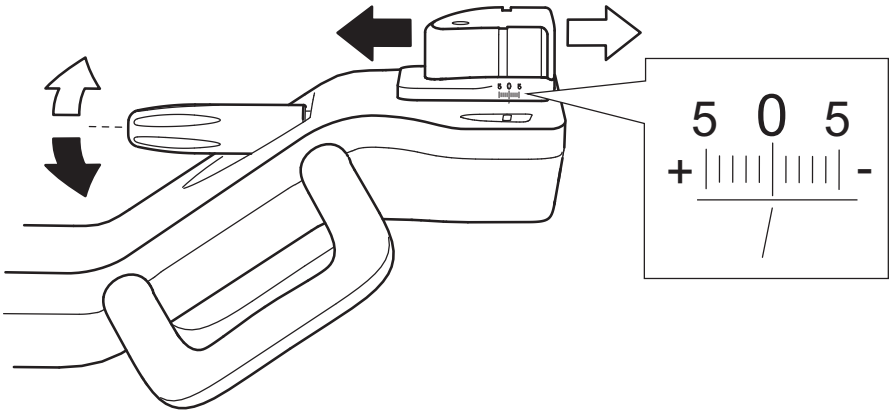
**Standard panoramic**



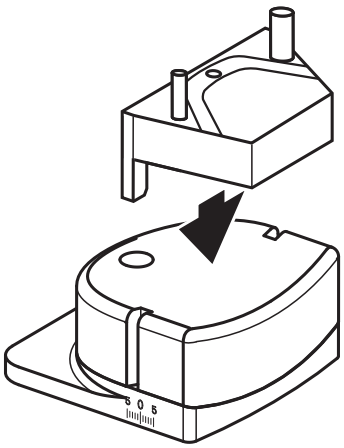

**Juvenile 70 kV**

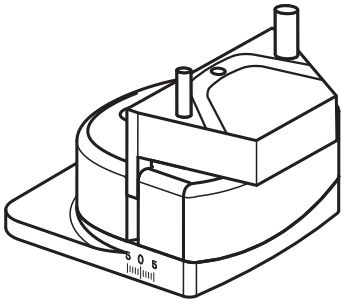
3. Set up the unit to take a **Standard Panoramic / Juvenile** (70 kV / 7.5 mA) exposure.
Refer to the unit User manual for information on how to do this.

4. Set the chinrest to the zero (0) position.




5. Attach the Ball and Pin Phantom to the chin rest.







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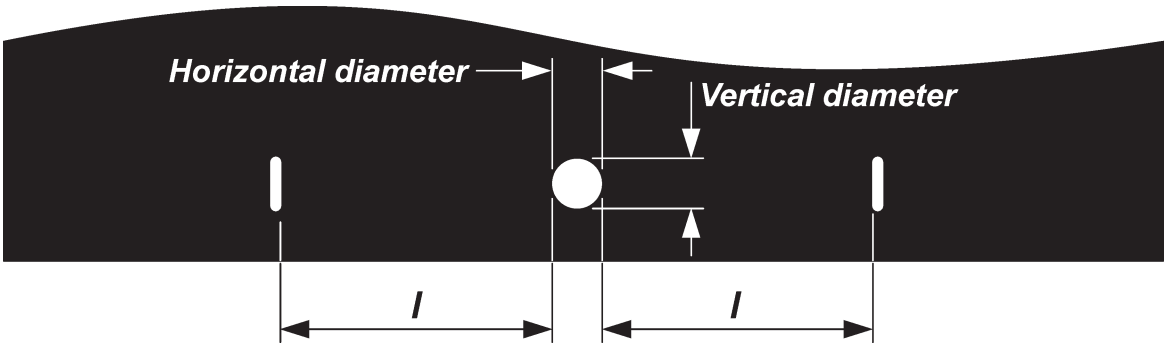
6. **Protect yourself from radiation.**
   Press and hold down the exposure switch to take an exposure.

7. **PC:** Use the measuring tools in the dental imaging software to examine the dimensions of the pins and ball that appear on the image. Magnify the image so that you can accurately measure the dimensions.

   If the image geometry is correct the center ball must be round with a difference of no more than **0.2 mm** between the horizontal diameter and the vertical diameter.

   Also the distances (***l***) from the side of the center ball to the sides of the pins must be equal with a difference of no more than **1.0 mm** between the two distances.




   If the center ball is NOT ROUND and/or the distances between the pins and the center ball are NOT WITHIN THE TOLERANCE, then the rotating unit (RU) or the chin rest must be adjusted.
   See **5.3 Adjusting the image geometry**.

   **IMPORTANT NOTE**:
   In some cases you may have to adjust the position of both the rotating unit AND the chin rest.



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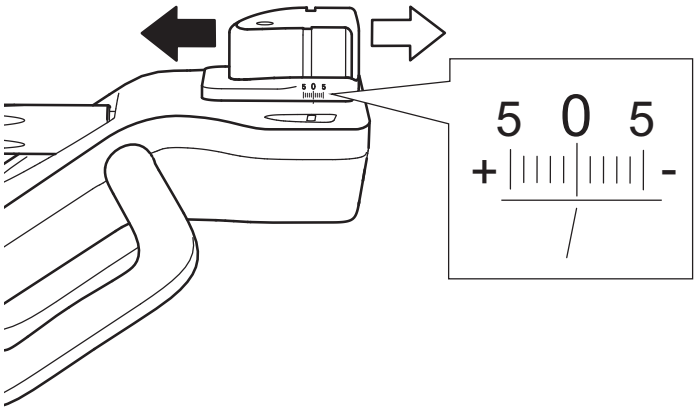
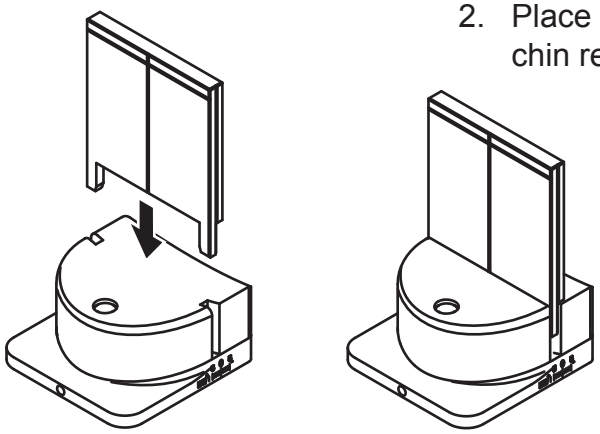
## 4.3 Checking the positioning lights

1. Position the chin rest to the 0 position.

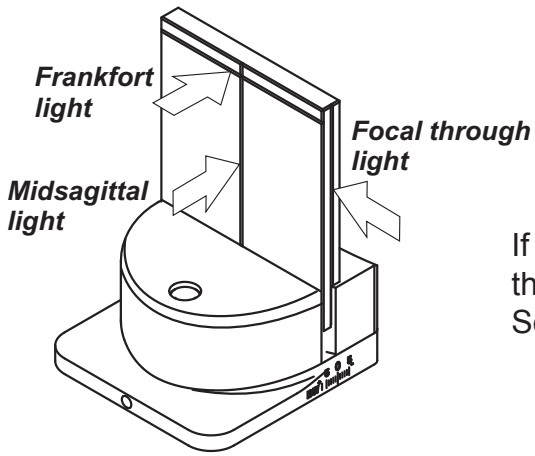



2. Place the laser alignment tool (supplied) in the chin rest.



3. Press the lights key.

4. Check that the lights hit the corresponding grooves on the laser alignment tool.




If any of the lights are not positioned correctly their positions must be adjusted.
See **5.4 Aligning the positioning lights**.



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## 4.4 Quality Assurance test

Additional Quality Assurance (QA) exposures can be taken after installation and periodically to ensure that the image quality remains stabile. The QA exposures can be taken using special QA program.

To take QA images you need an additional Cu (Copper) filter and Digital Test Tool (Prüfkörper test tool) that need to be ordered separately.

There are different thicknesses of the Cu filters, select the correct one depending on the national requirements.

The unit provides two different QA program selections (QA1 and QA2):

- QA1 is intended for use with 0,8mm thick Cu filter (in accordance to IEC61223-3-4)

- QA2 is intended for use with 1.8mm thick Cu filter.



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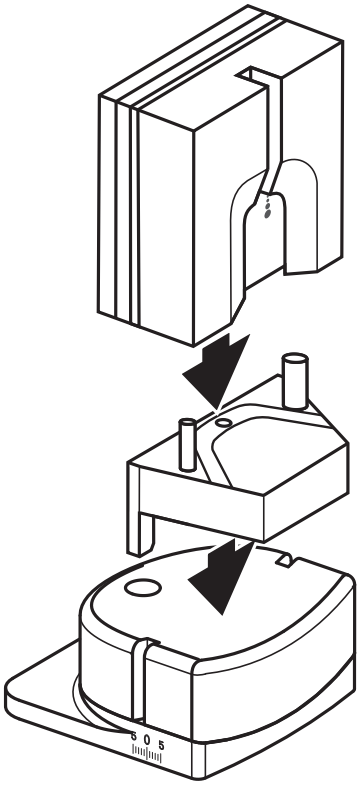
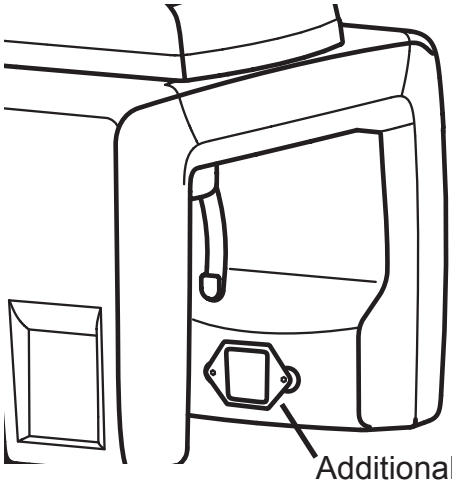
## Taking a QA exposure:

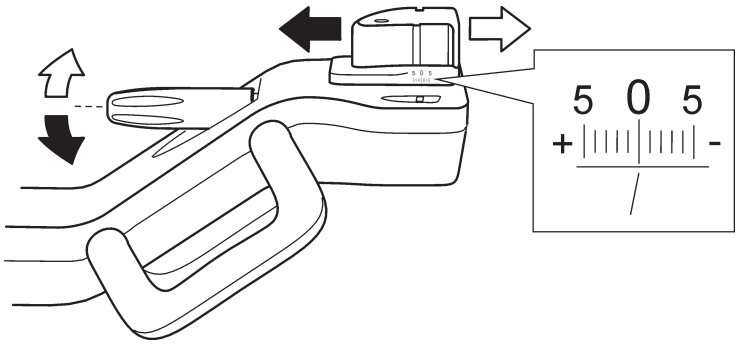
1. **PC:** Prepare the unit for an exposure



2. Attach the Ball and Pin Phantom to the Chin rest.
3. Then attach the Digital Test Tool (Prüfkörper test tool) to the Ball and Pin Phantom.
4. Attach the additional filter (Cu filter) to the center line of the tubehead inner cover as shown below. The filter has suction cups.




5. Set the chinrest to the zero (0) position.




6. Touch the service key on the main control panel of the unit to open the configuration screen.

7. Select **QA**

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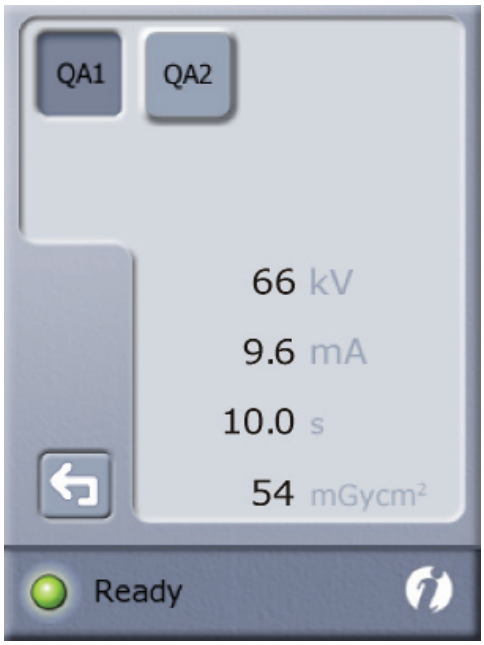


8. The QA program screen appears. Select from two preset programs which to use for the QA exposure.

**QA1** for use with 0,8mm thick Cu filter

**QA2** for use with 1,8mm thick Cu filter

9. **Protect yourself from radiation**.
Press and hold down the exposure switch to take an exposure.



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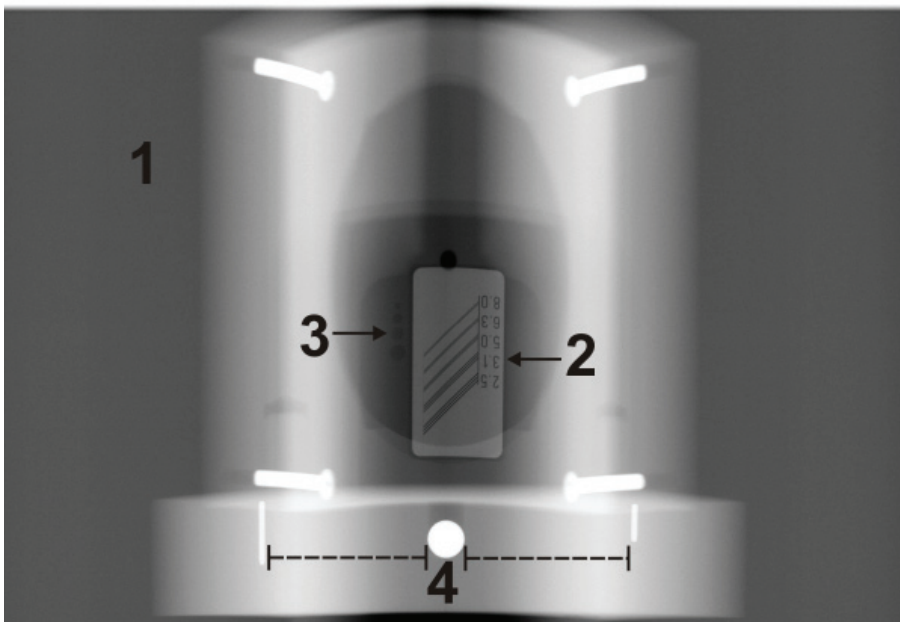


10. PC: Visually evaluate the result using the dental imaging software.

    Subjects to be evaluated:

    1. Exposed area; Smoothness of the exposed area. Non-exposed area surrounds the whole image.

    2. Line Pair Resolution; minimum 2.5 LP/mm must be distinguishable.

    3. Low contrast resolution; Minimum two low contrast resolution holes must be visible.

    4. Overall image geometry; Roundness of the center ball and equal distances to the pins. See **4.2 Checking the image geometry (Ball and Pin Phantom test).**

    **NOTE:**
    Some adjustments may be required to be made to the default image processing settings in the dental imaging software, when evaluating the QA image. Write down the used settings, so that the same settings can be used when taking the control images later on.

    **NOTE**:
    The QA images are recommended to be saved to a dedicated place or patient card. This way it is easy to use previous QA images as a reference during e.g. monthly Quality Assurance inspections.



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**NOTE:**
The expected Line Pair resolution is 3.1 LP/mm or better and all four low contrast resolution holes are possible to be distinguishable. The line pair and low contrast resolutions distinguishable from the image depend, not only on the unit, but also on other parts of the system, for example the dental imaging software being used.

## 4.5 Completing the Installation

Check that the unit functions correctly:

- Take a test exposure to verify that the unit operates correctly and the image is transferred successfully to the PC.

  **Protect yourself from radiation when taking the exposure.**

- Check the up/down keys drive the unit up and down.
- Check that the light key switches the positioning lights on and off.
- Check that when the emergency switch is pressed the unit stops operating.

Remote exposure switch

- If the remote exposure switch was installed, check that the remote exposure switch button works (initiates an exposure). Also check that the remote exposure switch warning light comes on and warning sound is audible during the exposure.

Finally reattach all the covers that were removed.



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# 5. Aligning the unit

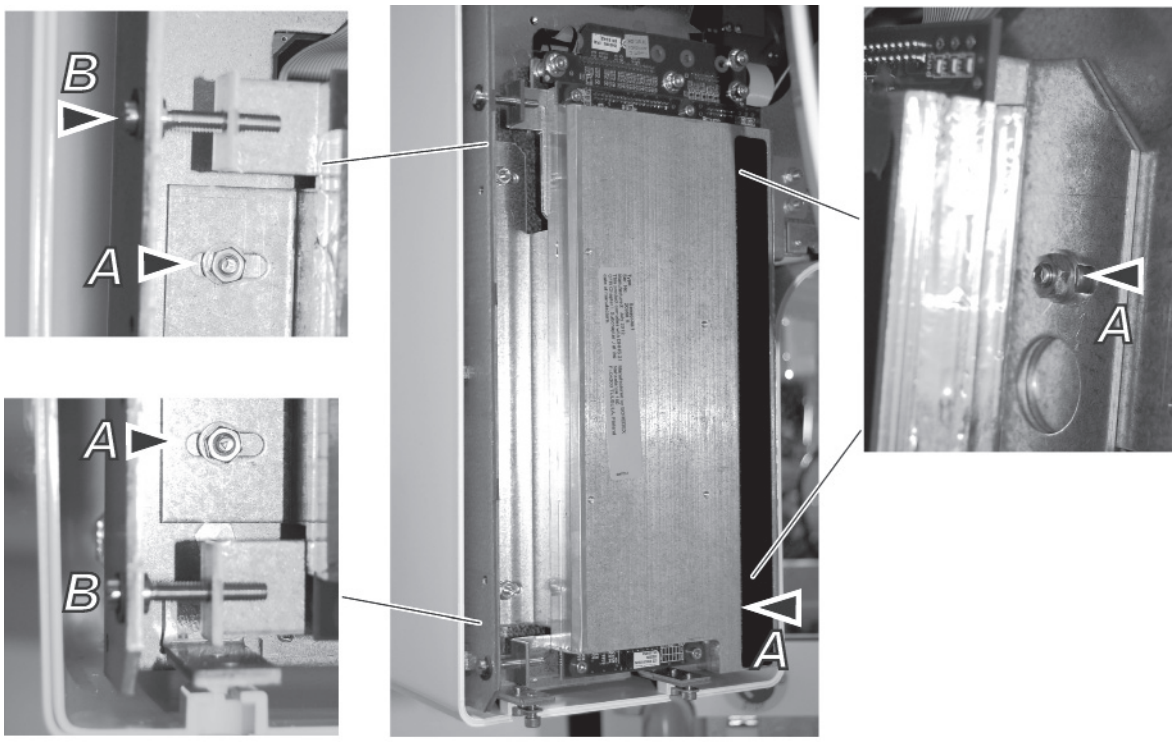
## 5.1 Aligning the CCD sensor

If the sensor was not correctly aligned after carrying out the alignment check (**4.1 Checking the alignment of the beam and the CCD sensor**) the sensor must be repositioned and new still mode images taken to confirm that it is correctly positioned.

**NOTE**:
When carrying out the CCD sensor alignment the unit must be in the **Still Mode**. If the unit is not already in the still mode activate it through the **Installation** screen, see section **4.1 Checking the alignment of the beam and the CCD sensor**, steps **1-6**.

1. Remove the inner sensor cover from the rotating unit. It is held in place with four (4) screws.

2. To adjust the CCD sensor loosen the four nuts (A) that hold the CCD sensor in place and then adjust its position with the two screws (B) on the left-hand side.



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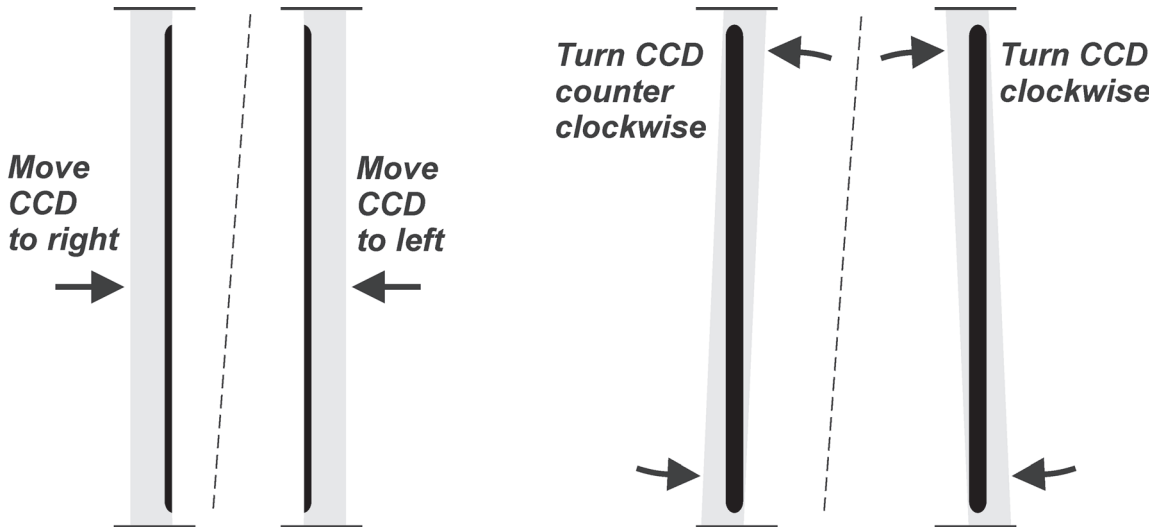


Adjust and recheck the position of the CCD sensor until the beam is vertical and centered in the middle of the CCD aperture.

3. After the adjustment, tighten the four nuts (A) that hold the CCD sensor in place.

4. Touch the **Arrow** key to exit the Still Mode and return to the main screen.

5. Now calibrate the sensor, see section **5.5 Calibrating the CCD sensor**.

## 5.2 Adjusting the beam

If the beam was not correctly aligned after carrying out the alignment check (**4.1 Checking the alignment of the beam and the CCD sensor**) the beam must be adjusted and new still mode images taken to confirm that it is correctly positioned.

**NOTE**:
When carrying out the beam alignment the unit must be in the **Still** mode. If the unit is not already in the still mode activate it through the **Installation** screen, see section **4.1 Checking the alignment of the beam and the CCD sensor**, steps **1-6**.



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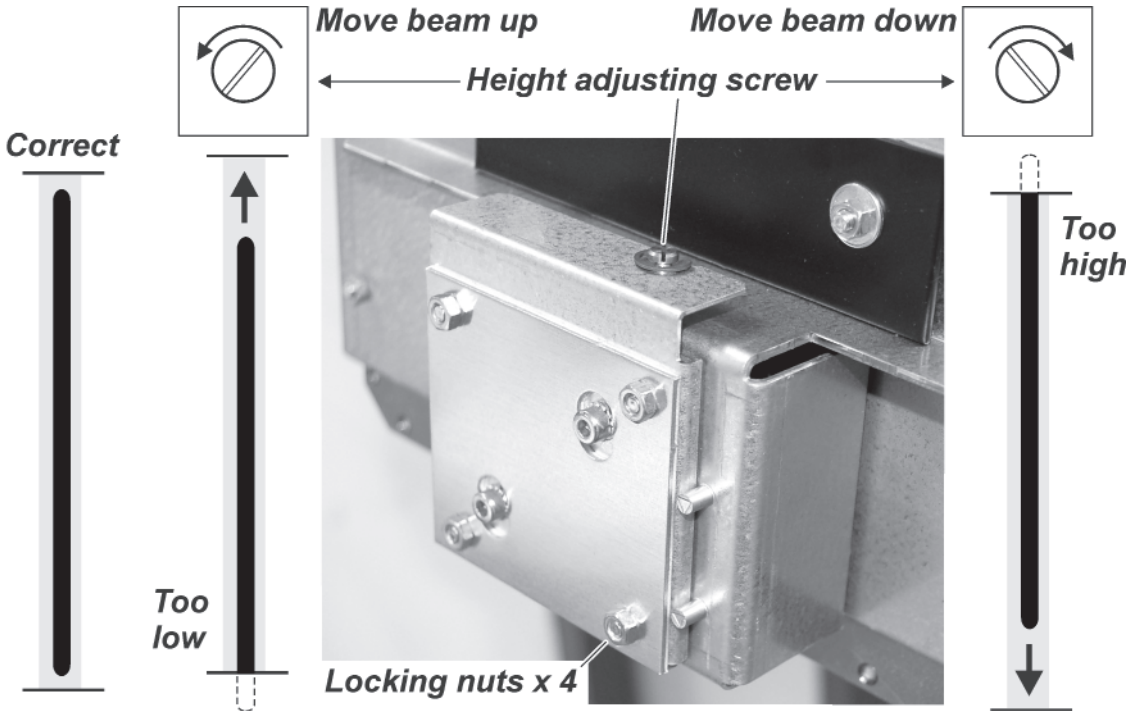
1. Remove the inner tubehead cover from the rotating unit, it is held in place with four (4) screws.

2. Loosen the four locking nuts that hold the collimator in place.

3. Adjust the beam position with the height adjusting screw.
   If the beam is too low turn the screw counter clockwise to move it up.
   If the beam is too high turn the screw clockwise to move the beam down.




Recheck the beam position. If not in the correct position, readjust. When the position is correct tighten the locking nuts.

4. Touch the **Arrow** key to exit the Still Mode and return to the main screen.

5. Now calibrate the sensor, see section **5.5 Calibrating the CCD sensor**.



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## 5.3 Adjusting the image geometry

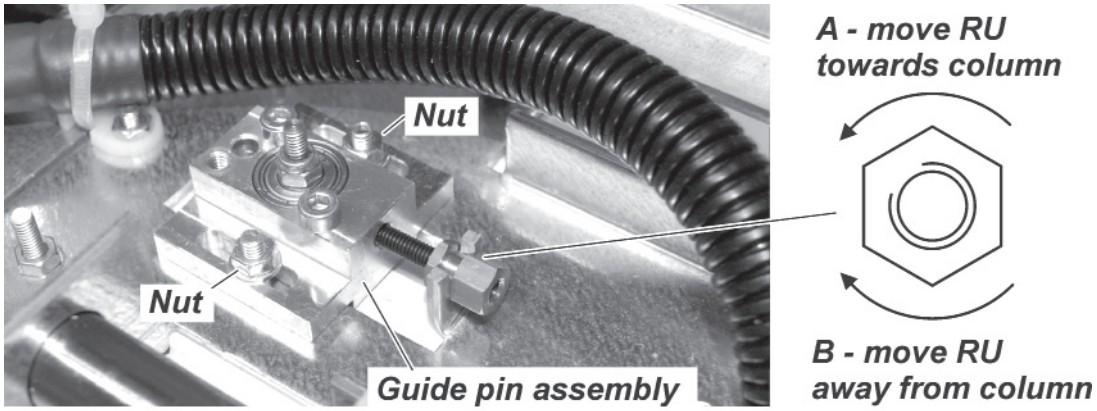
**IMPORTANT NOTE**:
In some cases you may have to adjust the position of both the rotating unit AND the chin rest.

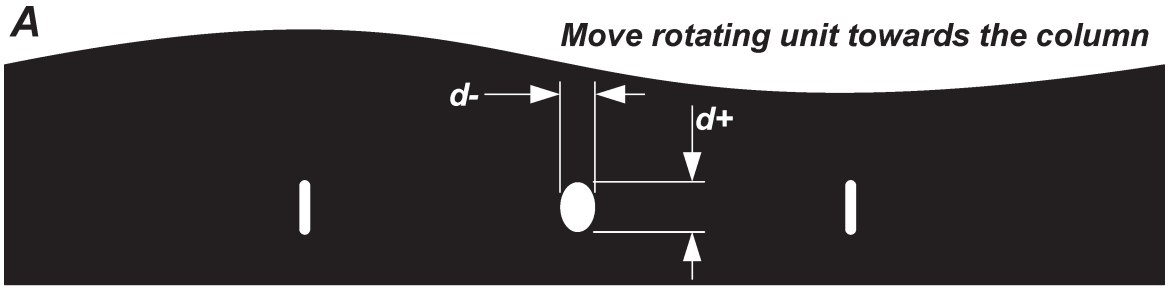
### Center ball not round

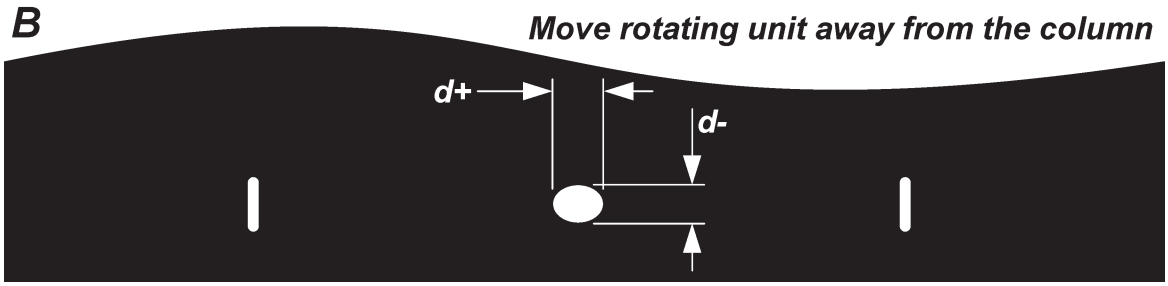
If the center ball is NOT ROUND then the position of the rotating unit (RU) must be must be adjusted.

1. Loosen the two nuts that hold the guide pin assembly in place.

   Turn the adjusting nut counter clockwise to move the rotating unit towards the column and clockwise to move it away from the column.



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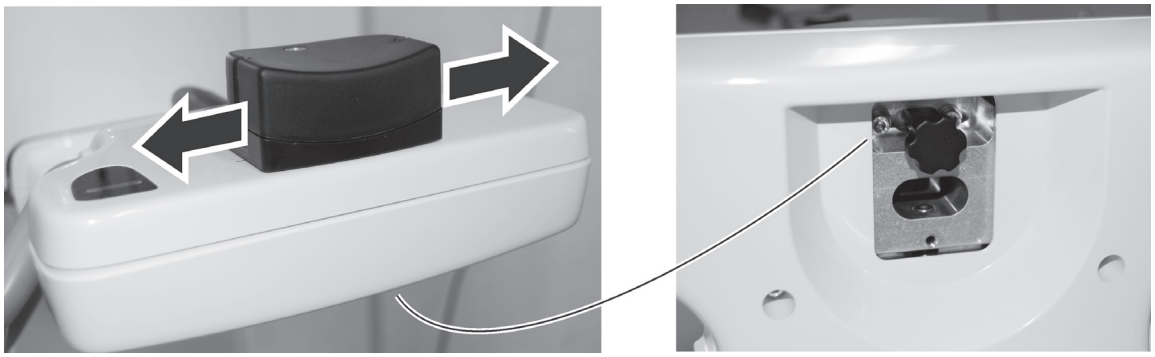
2. Re-tighten the guide pin assembly nuts after the adjustment.

3. Take another panoramic exposure of the Ball and Pin Phantom to confirm that the center ball is round. Also verify that the distances from center ball to left and right pins are equal, if not proceed to the next section, **Distances between left and right pins not equal**.

## Distances between center ball and left and right pins not equal

If the center ball is round but the distances between the pins and the ball are DIFFERENT then the chin rest must be must be adjusted.

1. Loosen the two screws that hold the chin rest in place (on the underside of the patient support).





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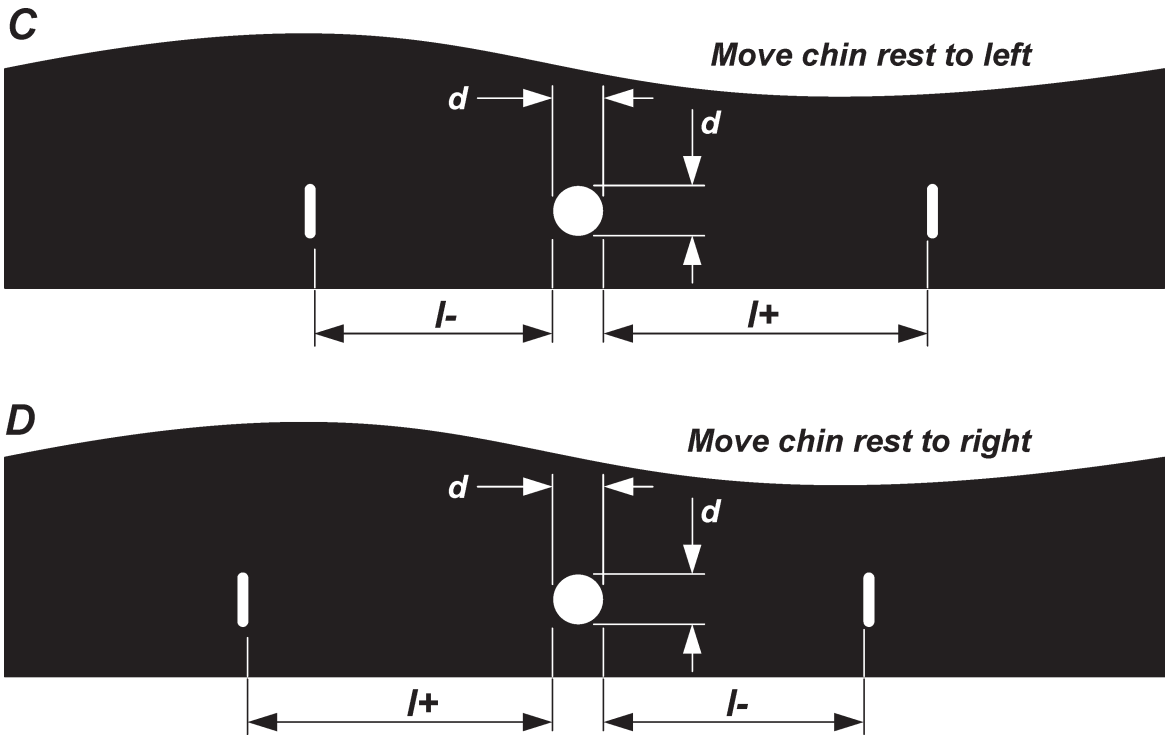
2. If the right-hand distance (***I+*** in picture ***C***) is greater that the left-hand distance (***I-***), move the chin rest to the left.
   If the left-hand distance (***I+*** in picture ***D***) is greater that the right-hand distance (***I-***), move the chin rest to the right.




3. Take another panoramic exposure of the Ball and Pin Phantom to confirm that the unit is now correctly aligned. Readjust if required.

4. After the adjustment has been done re-tighten the two screws that hold the chin rest in place.



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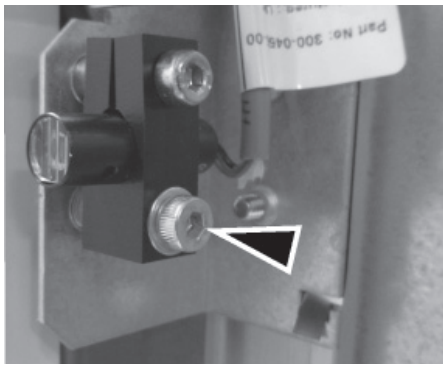
## 5.4 Aligning the positioning lights

### Midsagittal and frankfort

1. Remove the knob (1 screw) that adjusts the position of the frankfort light.

   Remove the mirror cover, it is held in place with magnets.



2. Loosen the clamping screws on the laser module and then rotate the laser to position beam vertically.



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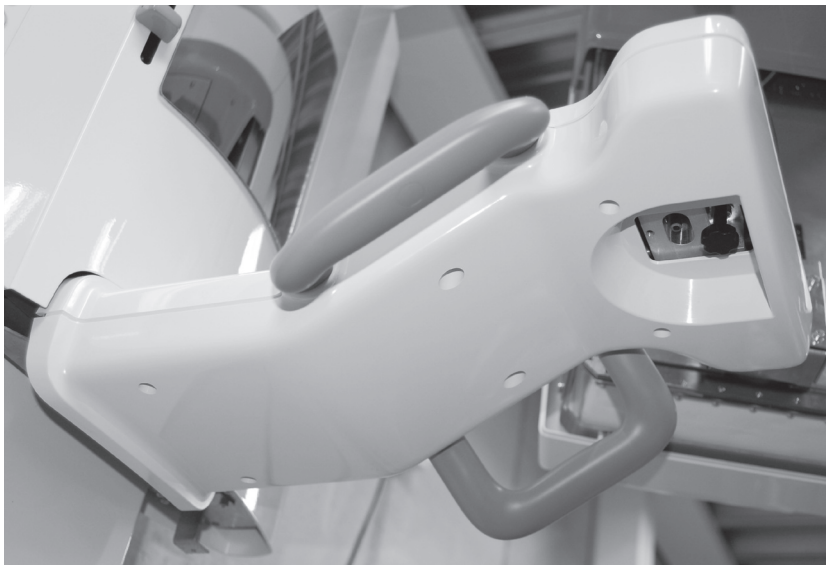
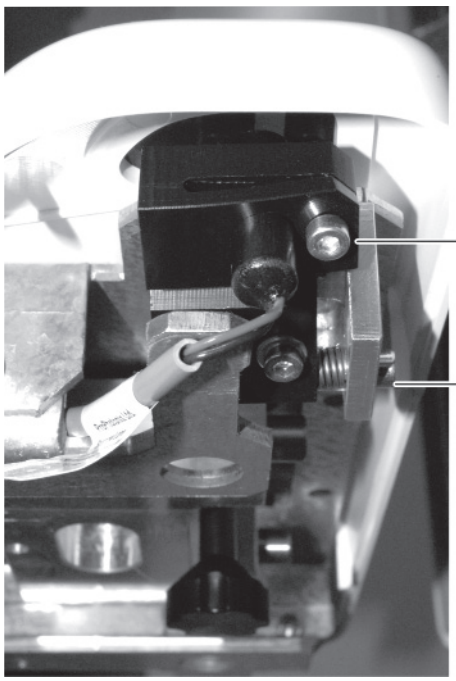
## Focal trough

1. Remove the lower cover from the lower shelf (6 screws).



2. Loosen the appropriate screw(s) and rotate the light and/or adjust it in the backwards / forewards direction until it is correctly positioned.




3. Check the positions of the lights again and then replace all the covers and adjusting knob.



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## 5.5 Calibrating the CCD sensor

**NOTE!** The CCD sensor is calibrated at the factory and thus does not normally need to be calibrated again.
However, if the error message "**Please calibrate the device**" appears on startup, calibrate the CCD sensor as described below.

Also, if you adjusted the alignment of the sensor, described in section 5.1, and/or adjusted the alignment of the beam, described in section 5.2, during installation then the CCD sensor must be calibrated.

1. **PC:** Prepare the unit for an exposure.

2. Remove the chin rest and make sure that there is nothing between the sensor and the tubehead.

3. Touch the service key on the main control panel of the unit to open the configuration screen.

4. Select **Installation**.

5. The personal identification number (PIN) screen will appear.
Key in **1204** and touch the **OK** (tick) key.
Then select **Image Calibration**.



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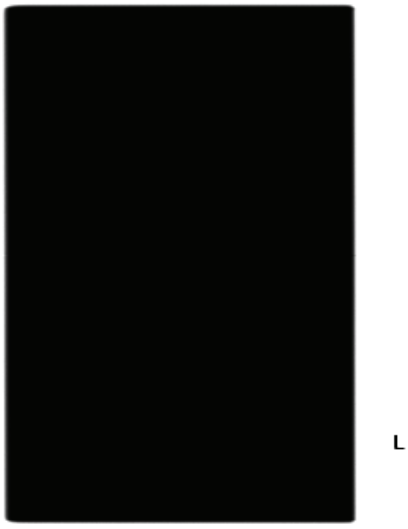
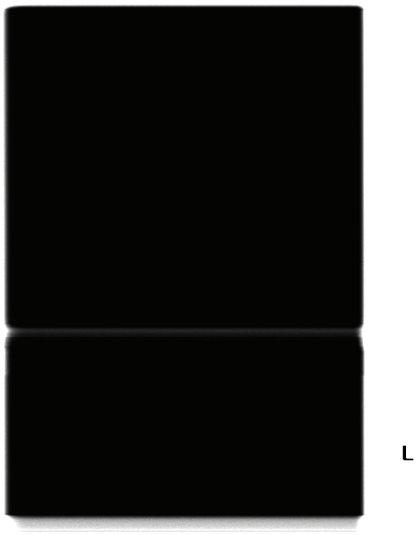
6. **Protect yourself from radiation**.
   Press and hold down the exposure switch to take an exposure.

7. **PC:** Use the dental imaging software to examine the image. It should be evenly grey all over with no granularity nor horizontal lines/ stripes. If the image is not evenly gray repeat the calibration until it is. If artefacts appear on the image make sure that there is nothing between the sensor and the tubehead.

***Correct image, no artifacts***




***Incorrect image, with an example of an artifact***




8. Touch the **Arrow** key to exit **Image Calibration**.



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## 5.6 Advanced Quality Assurance and Advanced Still Mode

Advanced Quality Assurance and Advanced Still Mode programs are similar to the normal QA and Still Mode programs, with the exception that in the Advanced programs the user can adjust the exposure values. These programs can be used in special cases.

Advanced QA program is meant to be used similarly as the normal QA program described in section **4.4 Quality Assurance test**.

Advanced Still Mode can be used for example for radiation measurements without the device movements. The user can set the duration, kV and mA values for the exposure. This program can be used for example in commissioning inspections as it enables service functions without service control through PC.

### Taking Advanced Quality Assurance and Still exposures

1. **PC:** Prepare the unit for an exposure

2. If Advanced Quality Assurance exposure is to be taken to evaluate image quality, prepare the unit as described in **4.4 Quality Assurance test** phases 2-5.

   If Advanced Still Mode exposure is to be taken, prepare the unit and related measurement equipment for a still mode exposure.

3. Touch the Service key on the main control panel of the unit to open the configuration screen.

4. Select **Installation**.



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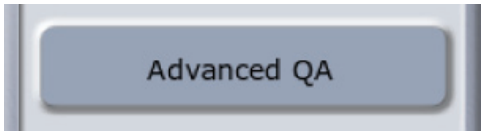
5. The PIN number screen will appear. This is a security feature to prevent the user from accidentally accessing the installation / service commands.

   Key in **1204** and touch the **OK** (tick) key.




6. Select **Advanced QA**.

7. The Advanced QA program screen appears. Select the needed program, Advanced QA (**QA**) or Advanced Still mode (**Still**) and adjust the exposure values using the plus (**+**) and minus (**-**) keys.

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8. **Protect yourself from radiation.**
   Press and hold down the exposure switch to take an exposure.

   **NOTE!**
   The rotating unit doesn't move while taking exposures in **Still Mode**.

(Advanced QA only)

9. **PC**: Visually evaluate the result using the dental imaging software.

   For QA image evaluation, see **4.4 Quality Assurance test**



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# 6. The exhibition stand

## 6.1 Attaching the unit to the exhibition stand

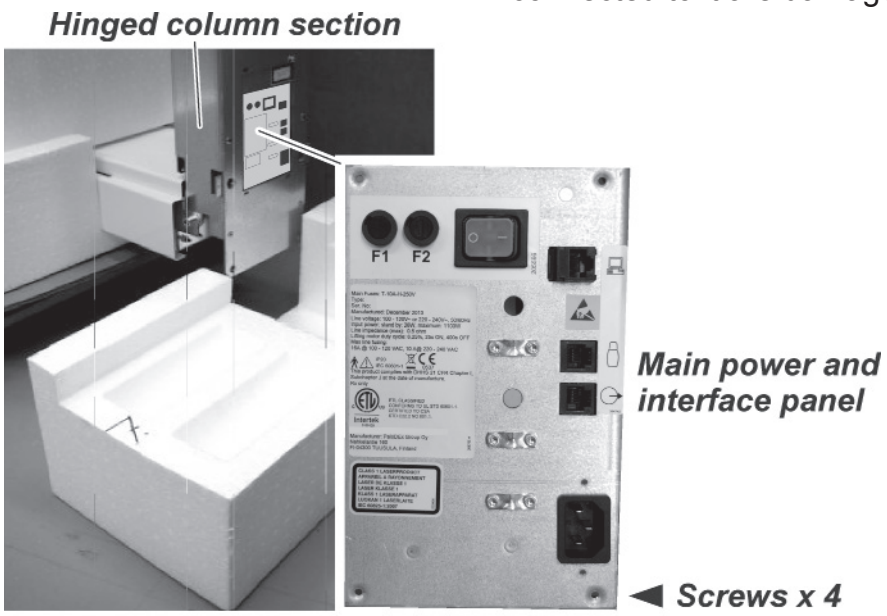
The exhibition stand is used if the unit cannot be attached to a wall or needs to be freestanding for some other reason.
The exhibition stand can be used also for installations in areas prone to earthquakes if it is not possible to attach the unit to the floor and wall.

**CAUTION - HEAVY OBJECT**
**A minimum of two persons are required for the following task.**

1. Unpack the unit as described in section **3.1 Preparing the unit for installation**, steps 1 - 4.

2. Assemble the Exhibition stand, refer to the **Exhibition stand assembly/disassembly instructions** supplied with the Exhibition stand.

3. Hold the main power and interface panel in position and then remove the screws (4) that hold it to the inside of the hinged column section. Carefully remove the main power and interface panel from inside of the hinged column section and place it next to the unit. Make sure that none of the cables that are connected to it are damaged or accidently



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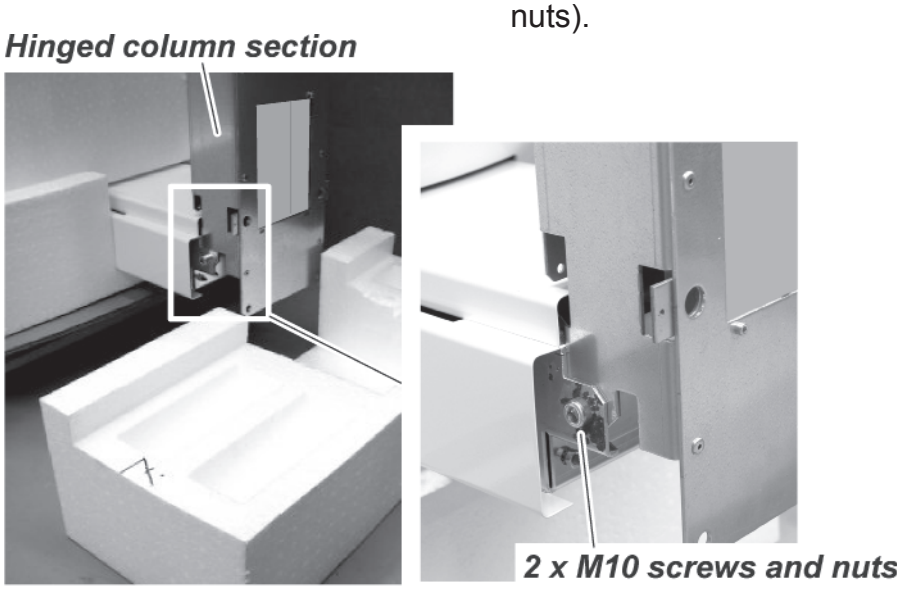
4. Remove the hinged column section from the bottom of the column (2 x M10 screws and nuts).




5. Position the assembled exhibition stand near the bottom of the column. Place some protective material on the floor and then turn the exhibition stand over onto its back.

6. Lift the bottom of the column until the fixing holes on the sides of the column are level with the fixing holes on the sides of the exhibition stand. Place some packing material under the column to hold it in position.

7. Slide the exhibition stand towards the bottom of the column until the fixing holes at the sides of the exhibition stand line up with the fixing holes at the sides of the unit column.
Then slide the main power and interface panel into the Exhibition stand. Make sure that you do not damage the cables when doing this.



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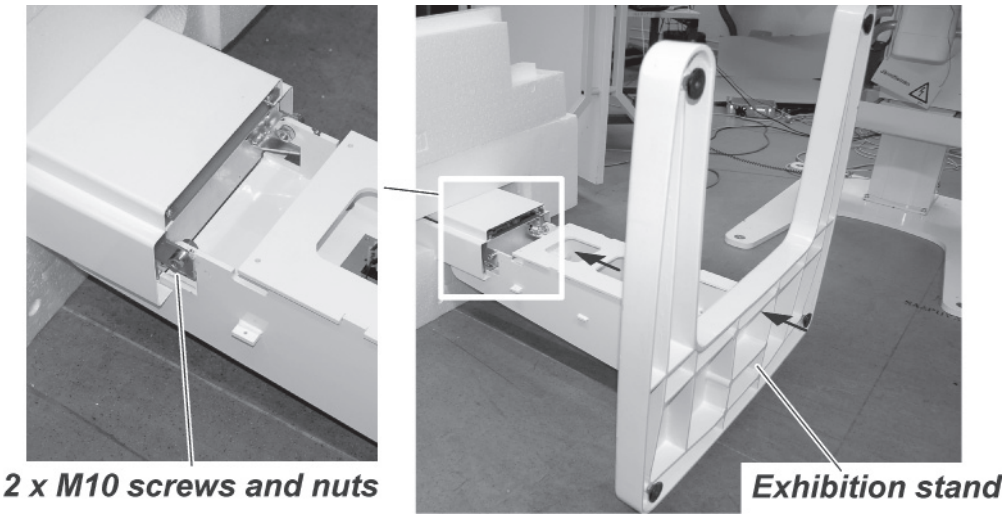
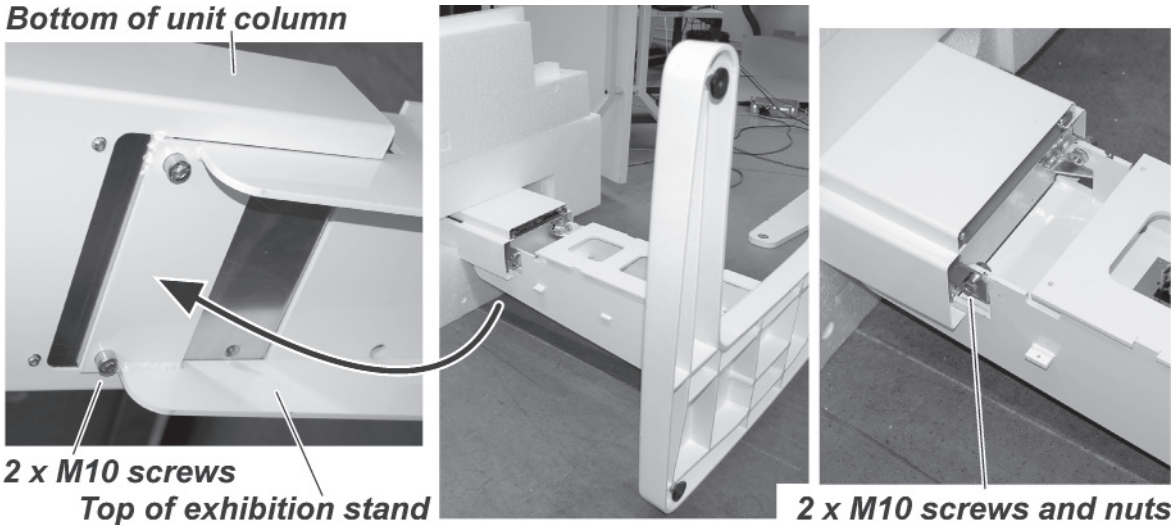
Attach the top of the exhibition stand to the bottom of the unit column with the 2 x M10 screws and nuts. Do not fully tighten the nuts yet.




8. While the unit and stand are still on the floor, attach the 2 x M10 screws to the rear of the exhibition stand. Tighten these screws and then tighten the 2 x M10 nuts on the inner sides of the unit.



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9. Attach the Main power and interface panel to the inside rear of the exhibition base (4 x M4x12). Make sure that all of the cables are connected.

*4 x M4x12*

*Front of exhibition stand*

10. **CAUTION - HEAVY OBJECT**
**A minimum of two persons are required for the following task.**

Lift the unit and exhibition stand to the vertical position.

**NOTE:**
When lifting the unit to the vertical position hold the unit by the column, NOT the rotating unit.

**CAUTION:**
Take steps to ensure that the unit and exhibition stand do not slip when being lifted.



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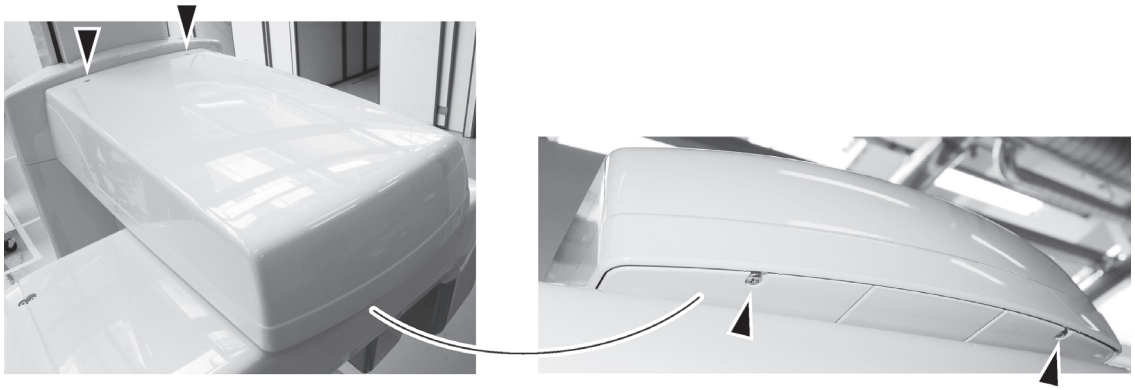
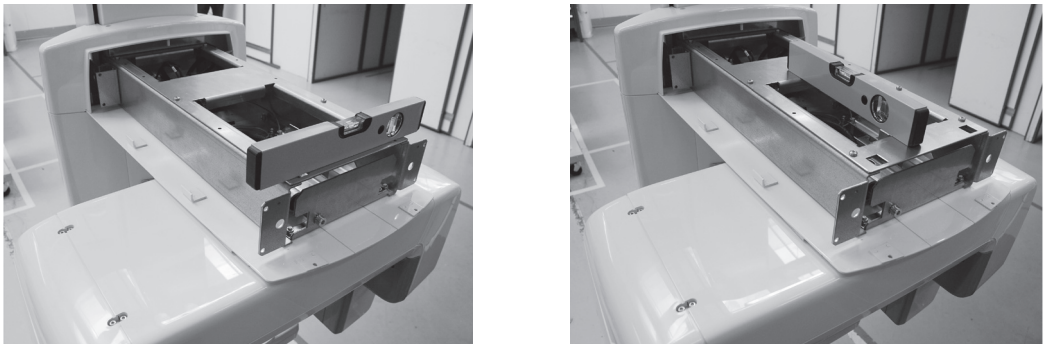
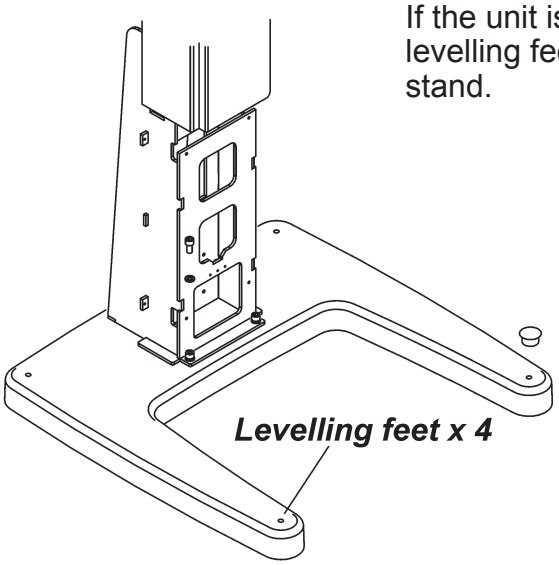
11. Remove all the packaging material from the C-arm and then remove the cover from the upper shelf (4 x M4 screws).



Place a spirit level first widthwise and thenlengthwise on the upper shelf to check that the unit is level.



If the unit is not level, level it by turning the levelling feet in the base of the exhibition stand.




Insert cover plugs after the unit has been levelled.



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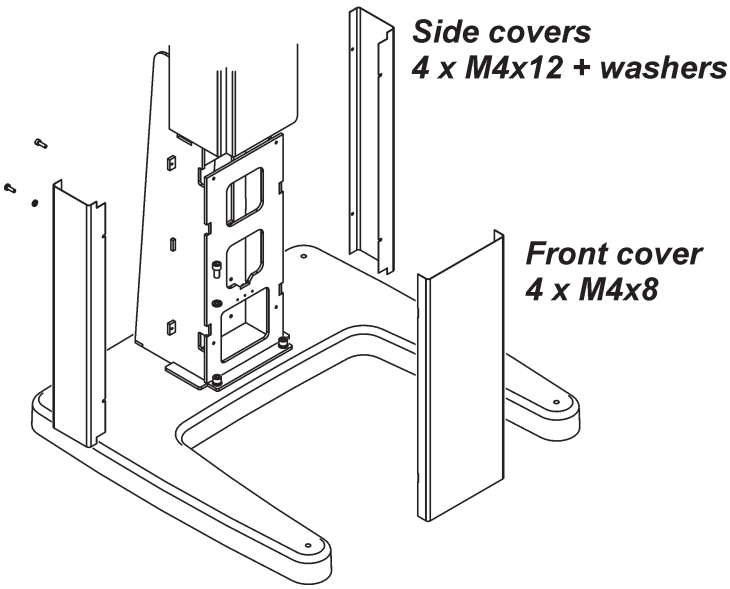
12. **OPTIONAL STEP**
    If the unit has to be fixed to the wall follow the instructions in section **3.2 Attaching the unit to the wall, step 2 onwards**.

13. Attach the covers to the exhibition stand.




14. Now follow the instructions in section **3.4 Installing the guide pin** to complete the installation.



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